

# Contents May 1919



Vol. XXIII

No. 5



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The war just ended was a war of men and machines—and victory came to the side with the greatest reserve force available at the critical time. The victories of peace will be won in the same way—and, in the industrial world, the winning machine will be the one having the greatest reserve of power and endurance to draw upon.

"NORMA" Bearings have ever been identified with the ignition apparatus and lighting generators which were a part of the cars, trucks, tractors, power boats and airplanes that won. It was so before the war, and throughout the war. And it will be so, now that peace has come again.

*Be SURE. See that your Electrical Apparatus is "NORMA" Equipped*

### THE NORMA COMPANY OF AMERICA

1790 BROADWAY

NEW YORK

Ball, Roller, Thrust and Combination Bearings



EDITED BY CHARLES F. CHAPMAN

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# A Newcomer on the Water

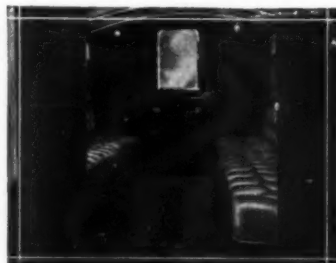
## *Fifty-Two Foot Standardized Express Cruiser*



**T**HIS new Fifty-two Footer, a Nineteen Nineteen Model Standardized Express Cruiser is the smartest and most striking craft that has ever been developed; a type embodying not only seaworthiness and speed in maximum degree, but also comfort, elegance and luxury throughout; a cruiser complete in every respect, ready for operation.



The interiors are done in mahogany; the upholstery is silk velour or imported broadcloth, matched with Wilton carpets and silk hangings; the fittings and equipment absolutely the best the market affords. A design that reflects sturdiness but yet permits of



a speed of 20 miles an hour; a cruiser which duplicates all of the comforts of the finest homes, as reflected in electric lights, running water, screens, box spring seat berths, worked out in harmony with the latest practice in the art of interior decoration.

*An illustrated catalogue will be sent forward upon request.*

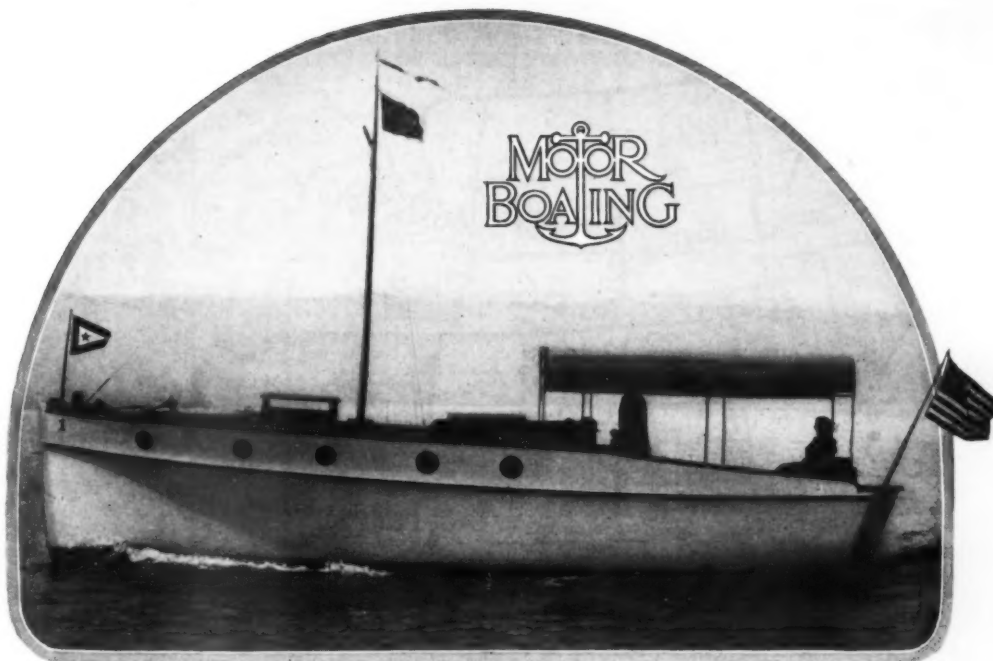
**GREAT LAKES BOAT BUILDING CORPORATION, Milwaukee, Wis.**

DESIGNERS AND BUILDERS OF  
BOATS OF DISTINCTION AND  
QUALITY



GREAT LAKES CRAFT ARE  
ALSO BUILT TO INDIVIDUAL  
SPECIFICATIONS





*Farad, owned by the editor of MoToR BoatinG, and assigned No. 1 by the Commissioner of Navigation.  
Note the number on the port bow*

## To Use Your Boat This Summer

Get Your Number, Pay Your Tax, Carry the Required Government Equipment  
and Then—Go Where You Please, Whenever You Please, and as You Please

*By Charles F. Chapman*

**T**HE lid is off.

How different motor boating will be this summer from what it was a year ago! There will be no more war regulations to be complied with, no more Navy Department licenses to be obtained, no more restricted zones, no more reporting to this or that patrol boat every few minutes during one's cruise, no requirement that we get to our mooring before sun-down or obtain special permission each time we desire to go to our favorite fishing grounds, no more gasless Sundays or the consequent going out of commission weeks and weeks earlier than formerly and no more of the many other restrictions which necessarily had

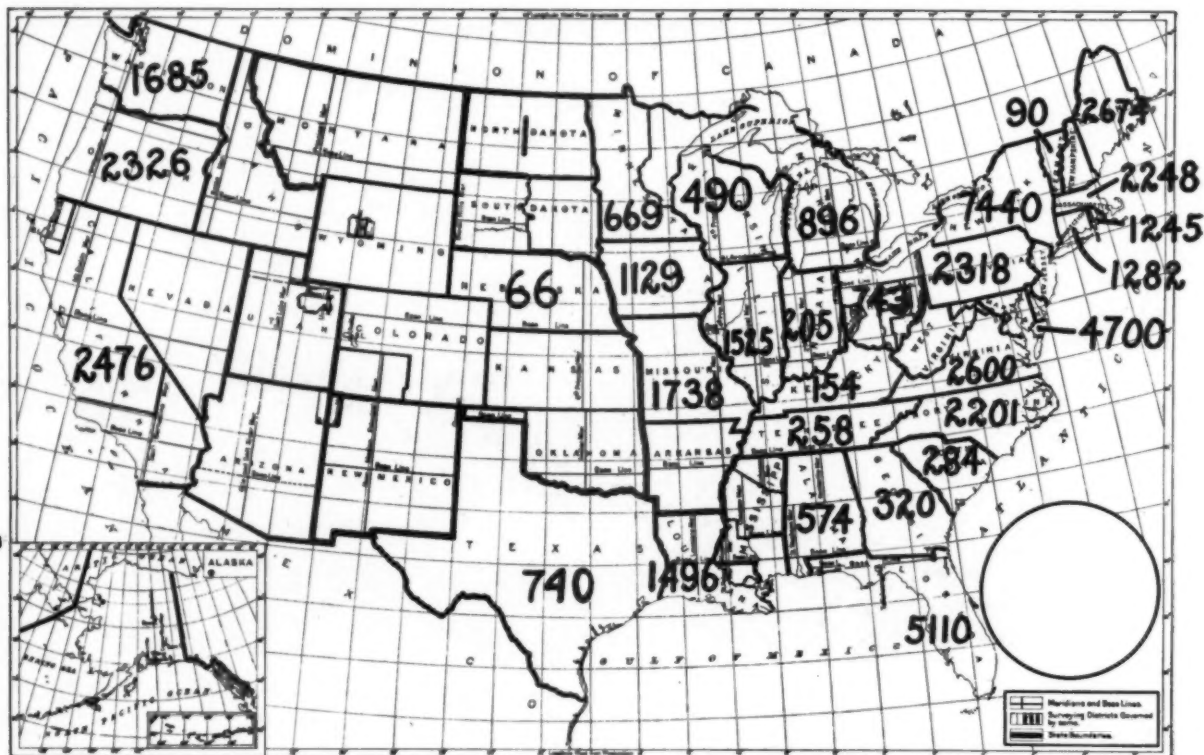
to be in force during the period when our nation was at war.

For the coming season, and for all times it is hoped, there will be no limitations whatsoever on the use of motor boats on the Federal waterways of the country. It is true that since last year legislation has been enacted by Congress which requires all boats to carry a small number on each bow but the means of obtaining this number has been made so easy and the fact that there is no charge for the number and that the number never has to be renewed should not work the slightest hardship on anyone.

In addition to the number, it will be necessary for every

DEPARTMENT OF COMMERCE BUREAU OF NAVIGATION WASHINGTON		DEPARTMENT OF COMMERCE BUREAU OF NAVIGATION WASHINGTON	
No. _____ <small>(Do not write in this space.)</small>	Name of owner _____	No. _____ <small>DO NOT WRITE IN THIS SPACE</small>	Name of owner _____
Name of owner _____	Name of vessel _____	Name of vessel _____	Name of owner _____
Address _____ <small>(Street and number.) (City and State.)</small>	Type of vessel _____	Type of vessel _____	Address _____ <small>(STREET AND NUMBER) (CITY AND STATE)</small>
Name of vessel _____	Length over all _____ ft.; beam _____ ft. Horsepower of engine _____	Length over all _____ ft.; beam _____ ft. Horsepower of engine _____	Name of vessel _____
Length over all _____ ft.; beam _____ ft. Horsepower of engine _____	Principal occupation of vessel _____	Principal occupation of vessel _____	Length over all _____ ft.; beam _____ ft. Horsepower of engine _____
Principal occupation of vessel _____	I certify that the above statements are true and hereby make application for a number for the vessel described.	I certify that the above statements are true, and hereby make application for a number for the vessel described.	Principal occupation of vessel _____
Date _____ <small>11-6283</small>	(Signature) _____ <small>(Owner—Master.)</small>	Date _____ <small>11-6283</small>	(Signature) _____ <small>Owner—Master</small>

The two cards which will be sent to the motor boat owner when he applies for his number and must be filled out by him. Instructions for filling out card: 1—Write clearly and legibly. 2—Indicate whether the person signing is owner or master by crossing out the word which is not applicable. 3—If vessel has no name, say "None." 4—Type of vessel—state, for example, whether raised deck, cabin trunk, auxiliary houseboat, open, etc. 5—To determine the length, measure from end to end over the deck, excluding sheer (i.e., have the line taut). 6—Principal occupation of vessel—state for what purpose the vessel is principally used, as for example, pleasure, oystering, fishing, carrying passengers for hire, transporting merchandise, etc. Send this card filled out, to the Collector of Customs, in whose district the vessel is owned



Although the numbering law had been in operation only two months (and these were winter months) yet nearly 50,000 motor boats had been numbered in this time by the Collectors of Customs. The figures on this chart shows the number of boats numbered in the various states up to the middle of February

motor boatman before he uses his boat this summer to pay the Federal excise war tax which is imposed for the use of his boat. While we all admit that this tax is more or less of a hold-up and rather exorbitant in its size, yet it is one of the rewards of Victory and must be paid by all. It is quite probable that if the proper organized effort is made on the next Congress which is about to assemble, the tax on the use of motor boats can be removed altogether if not greatly reduced.

The third requirement which a motor boatman must look to is that the necessary life saving equipment required by the Government is on board his craft all the time she is underway. However, these requirements are no different from what they have been in the past and therefore will not require further attention if your boat has been properly equipped in the past.

The most important A copy of the letter you will receive from the Collector of Customs

Oct. No. 1213

# AWARD OF NUMBER TO UNDOCUMENTED MOTOR VESSEL

DEPARTMENT OF COMMERCE  
BUREAU OF NAVIGATION

*C. F. Chapman,*  
119 West 40<sup>th</sup> Street.  
N. Y. City

Office of the Collector of Customs,  
Port of NEW YORK, N. Y.  
JAN 25 1919, 19...

Sir:

In compliance with your application, number 1 is hereby awarded your power vessel.

This number must be painted on or firmly attached to each bow of the vessel, in such manner and color as to be distinctly visible and legible, and must be not less in size than 3 inches high and of proportionate width. They must be of the Arabic style and the letter of the block or Gothic type. For example:

**A 35**

Inclosed is a copy of the law requiring these numbers and also Department Circular No. 236, showing the equipment you must carry on your boat when she is being navigated. Failure to comply with either of these laws will involve the penalty provided.

Respectfully,

BYRON R. NEWTON  
Collector.

2 inclosures.

11-1000

of the three requirements mentioned is probably that of numbering. As most motor boatmen will remember, this new law went into effect December 7 last and requires that all motor boats, both ashore and afloat, must carry a number at least three inches high on each bow, the number to be assigned to the owner by the Collector of Customs in the district in which the owner lives.

In order to obtain one's number it is necessary for one to either call upon the Collector of Customs of his district or make application by mail for a number for his boat. The Collector will then send to the owner two blank cards similar to those illustrated on page 7, to be filled out by the owner and returned by him to the Collector of Customs. By referring to the reproductions of the cards shown on page 7, it will be seen that the only difference in the cards is that one is prepared so that it can be filed numerically, while

the other card will be filed according to the name of the owner. On each card are lines for the name and address of the owner, type of boat, that is, whether the craft to be numbered is of the raised deck, cabin, trunk, houseboat or open type, a place for the length and beam of the boat, the horsepower of its engine and the particular occupation of the vessel, that is, whether it is used for pleasure purposes, oystering, fishing, carrying passengers for hire, etc.

After the owner has returned his two cards to the Collector of Customs by mail or otherwise, the Collector will assign a number to the boat and owner applying for it in conformity with a system adopted by the Bureau of Navigation of the Department of Commerce to distinguish between the various Customs districts. In other words, not only will the owner and boat be assigned a number but with the exception of the New York District a letter will also be assigned which must be used with the number. This is done also to keep down the size of the numbers so that the largest number will not contain more than four figures in addition to the particular letter. The let-

### EQUIPMENT REQUIRED BY LAW TO BE CARRIED BY EVERY MOTOR BOAT WHILE UNDER WAY

#### Class I—Boats Under 25 Feet, L. O. A.

*Lights*—Combination red and green lantern (or bow and colored side lights) and stern light.

*Sound Apparatus*—Whistle capable of producing blast prolonged for at least two seconds.

#### Class II—Boats 26-40 Feet, L. O. A.

*Lights*—White forward light (lens at 19 square inches); white stern light; green starboard light; red port (lenses at least 16 square inches); screens at least 18 inches long; lenses, fresnel or fluted glass.

*Sound Apparatus*—Same as Class I, plus fog horn and bell.

#### Class III—Boats 40-65 Feet, L. O. A.

*Lights*—Forward light with lens at least 31 square inches; white stern light; green starboard light; red port light (lenses at least 25 square inches); screens at least 24 inches long; lenses, fresnel or fluted glass.

*Sound Apparatus*—Same as Class II, except bell must be at least 8 inches across mouth.

#### All Classes.

*One life preserver* for each person on board. Life preservers, life belts, buoyant cushions, ring buoys, or similar devices in sufficient number for every person on board, and placed so as to be readily accessible. Life preservers or buoyant cushions must be capable of keeping afloat for twenty-four hours a weight exerting a direct downward pull of twenty pounds, on boats not carrying passengers for hire. No pneumatic life saving appliances, or appliances filled with granulated cork will be permitted. Planks, grating, etc., or small boats in tow cannot be substituted for required life saving appliances. Floats of seasoned wood, not exceeding white pine in weight, and measuring at least 4 feet by 14 inches by 2 inches, may be used. (See page 35.)

*A fire extinguisher* capable of extinguishing gasoline fires.

*At anchor, a white light* only, less than 20 feet above the hull, visible around horizon for at least one mile.

*Two copies of the Pilot Rules* must be carried on board.

ters will, in some cases, prefix the number and in other instances will follow the figures. The table printed on page 64 shows the letters assigned to each Customs district.

The Collector of Customs will notify each owner of the number assigned to him. The reproduction of letters of notification to the writer assigning him No. 1 is shown on page 8.

Of course, it is a fact that the number of cities and towns where there is a Collector of Customs is rather limited. A list of the principal places where the Collectors of Customs have offices and where it is proper to apply for your number is shown on page 64.

If the motor boat owner receives notification of the number assigned to him, he must either paint these numbers on the bow of this boat or attach metal or wooden numbers thereon. No special type or form of number is specified, the only provision being that they are easily distinguished and are at least 3 inches high.

Certain classes of motor boats are exempt from the provisions of the numbering bill and these include (a) vessels registered, en-

(Continued on page 60)



On the right: the Hon. A. J. Tyrer, Deputy Commissioner of Navigation, friend of the motor boatmen and father of the numbering law. Mr. Tyrer is here seen making an inspection trip on the Potomac aboard Commodore Bennett's cruiser *Aragon*. The Commodore is at the reader's left



# Why Should I Own a Motor Boat?

No Other Recreation Offers Such a Complete Change as Does Motor Boating—Set the Motor Humming and the Limitless Vistas of the Waterways of the World Lie Before You

By Stillman Taylor

**I**F you ask the first motor boatman you may chance to meet the reason why he likes to spend his spare time on the water and take his recreation behind the wheel of a motor driven craft, he will very likely tell you that the sport appeals to him because it is a pleasant change from everyday life upon shore; that it is a clean sport that takes him away from the hot and dusty thoroughfares out into the sunny, wind-swept open where there is always a cool breeze blowing and where there is found neither noise nor a crowd to interfere. And if you ask him further what kind of motor boating he may happen to prefer, he will mention but one of many enjoyable phases of this really great and exhilarating sport, as he happens to own a well-known speed boat, a natty little runabout, a comfortable cabin cruiser, or perhaps a luxurious motor yacht as completely furnished as the bungalow on shore.

And from this you may infer that the sport of motor boating is a recreation replete with much interesting variety. It is, and while many who are not very familiar with boats may suppose that a boat is a boat and boating just a sport like tennis or golf, those who are familiar with the water will inform you that boating, and motor boating in particular, can boast a much greater variety than the majority of recreations. Every sport which takes us out into the fresh air has gained a certain degree of popularity but many are enjoyed by but a comparative few, for some, like tennis, are too strenuous for elderly people, while others, such as golf, cannot be enjoyed by us who live remote from clubs.

There are just three important recreations which may be grouped under the one caption of universal sports and these are shooting, fishing, and motor boating. All three are enjoyed around the world and are closely allied because the motor boat is so much used by sportsmen as a handy way of traveling to the best shooting regions and there is, of course, no more convenient way of reaching the best fishing grounds of river, lake or sea than by the quick and dependable motor boat.

Yes, there is plenty of variety in the sport of motor boating and the only qualification necessary to thoroughly enjoy it is a stretch of navigable water. I have met many enthusiastic motor boatmen, some are regular motor boat bugs and the sport is their one great recreation and absorbing hobby. A few are big business men who own expensive motor yachts manned by a professional crew, but the great majority are men who own small and medium-priced craft and it is these men who man their own boats and who are actively interested in the sport for the healthful pleasure they glean from it, that has as easily boosted motor boating as a popular pastime until it now occupies an important place in the trio of universal out-door sports. If a man likes the water and lives within reasonable distance of lake, sea or river, there is no reason why he cannot enjoy the sport. I know of one motor boat club which has grown from a little group of ten members in the last five years to an organization of over 100 members. All of these men live in a city fifteen miles distant from the large river on the banks of which they have now built a comfortable clubhouse. And I know of several groups of out-door men who have shipped in to build little cabins on some picturesque bit of river shore and who find recreation in running down to the little home in the woods over week-ends. And on this river, which has a navigable length of some sixty miles, there is seen on Saturdays and Sundays a large and ever growing fleet of motor boats. Many simply take a spin for a few hours, others are off for the day with their families, and as many others make the run to the sea, some in cruisers and others with their camping duffle snugly stowed in the open runabout. In this procession of motor craft one sees a big variety of different types of boats. There are quite a few classy 35- to 70-foot cruisers but

the majority of craft are smaller, running from 20 to 25 feet and about every type of motor boat is represented—raised-deck cruiser, hunting-cabin boats, runabouts of the latest types and a motley assortment of fantail launches, compromise-stern boats, plumb transoms, V-in and V-out and even the torpedo-stern type is still seen. Many of the craft are unmistakably home-made, crudely finished and gayly painted and striped but all are equipped with gasoline engines which make their shippers independent of wind and tide and take him and his family out into the fresh air and sunshine for a few hours' sail, a day's picnic or perhaps for a fishing or shooting trip. This is merely one matter-of-fact illustration but it shows the big appeal of the motor boat to a large class of out-door loving people, from the well-to-do manufacturer or professional man all the way down the financial scale to the clerk and factory worker who enjoys the sport in an inexpensive twenty-footer with a single-cylinder motor. And this illustration carries with it this moral: that you can enjoy the sport of motor boating likewise, for you neither have to possess the income of a banker or the skill of a mechanic to own and run your own motor boat.

In the words of Captain Jerry, that old sea-dog and former Grand Banks fisherman, "Motor boating is a sport with pep and tang. Any craft will do but a clean easy hull and a spankin' engine will make a flying-fish of any man. Sails may do, but ye need a kicker to give all the fellers a holiday. I ain't much of a racing man but I kin see the p'int of the feller who itches to take the wheel of them speed machines. And them that doesn't want speed can buy a good open craft or a croosier or a staunch little ship like me Mary Ann, and jog along comfortable like ahead of wind and tide. If ye can't raise the wad for a big boat ye can get a good little one. Motor boating, me boy, is a sport for me and you and all that likes the water. It is a sport for all and no one is too old to enjoy it, no one too rich nor ag'in so lightly heeled that he can't own his own little ship." And with this statement of unexaggerated fact a thousand and one motor boatmen will at once agree.

I have visited a wealthy business man who has a large estate some fifty miles from a large city where his interests lie, and he has established a fast and agreeable express ferry service between the country home and his office by means of a fifty-foot express motor boat having a speed of 40 m.p.h. "I prefer the motor boat to the automobile," he recently told me, "because the run to the office in the morning and the return in the cool of the evening is the finest kind of a relaxation and tonic. When I jump into my boat in the morning I can look forward to a most enjoyable hour and a quarter in the cool, fresh air, and when I reach the office I am in fine fettle to tackle the work of the day. And after a hard day's work in the heat of the city the return trip gives me a chance to cool off and I am ready for dinner with a good temper and a healthy appetite." This is just one instance where the recreation of motor boating is happily combined with daily commutation—one phase of the pleasure and utility of the motor boat.

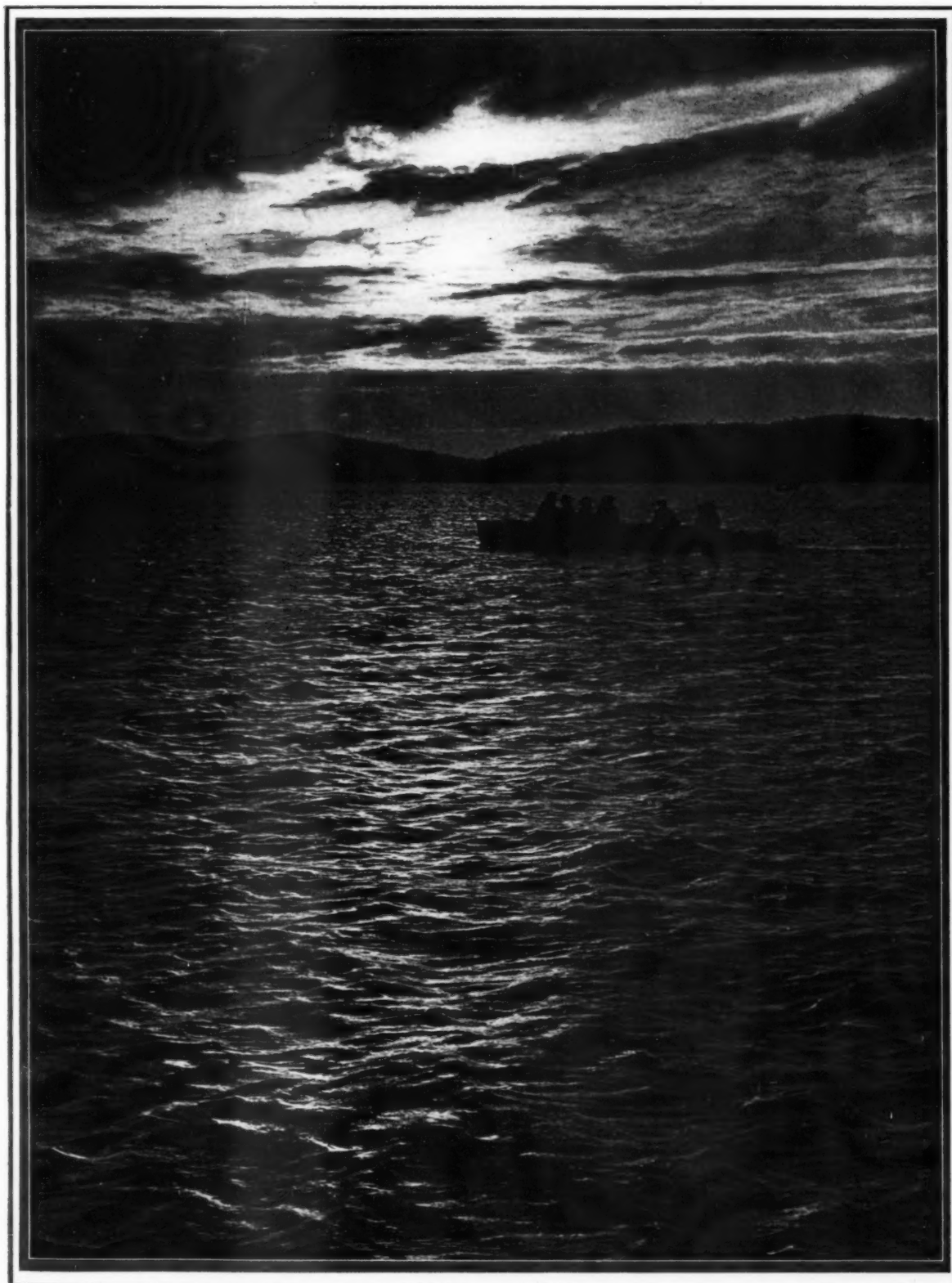
One of my good friends is a musician and composer and for the last three years has spent the greater portion of the summer months in a cosy bungalow on the shore of a 4-mile lake not far from this city. He is an enthusiastic fisherman and as there is plenty of bass and pickerel in the lake, I suggested that he would find a portable motor a handy thing to convert his fishing skiff into a self-propelling craft for trolling as well as for an occasional spin around the wooded lake. He is the most unmechanical fellow in the world but the easily handled and dependable little out-board motor has converted him into a motor boat follower for all time. When I visited him last summer I saw tied up to his little dock a spick and span little 22-foot motor runabout and he told me, "That little portable motor







## It Is a More Distinct Change Than Any Other Sport



Photograph by John Kabel

*It is only on the water that a soft glowing moon beaming good naturedly down on mellow June nights gives the proper impulse to the dormant affection that lies in the hearts of wistful youth. There it is that the shimmering rays reflected a thousandfold on the dancing wavelets bring back to ripe old age visions of that springtime of life when their thoughts lightly turned to love and memory travels back through years of happy companionship and blissful satisfaction*

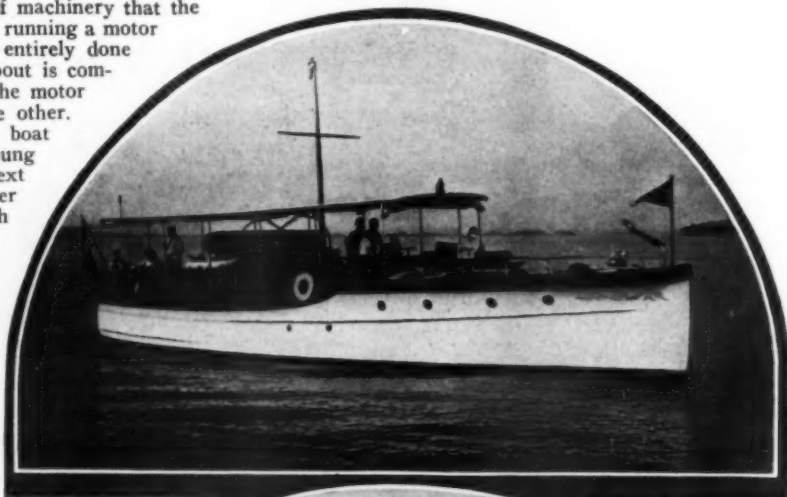
you advised me to buy has proven the best investment I have ever made. I have spent many pleasant hours in chugging around the lake in search of minnows for bait and for trolling my little engine has been always on hand to do the work better than the unreliable boatmen I have formerly hired. I have no more native ingenuity or mechanical ability than a child but I have had no trouble at all in running the motor and now I have a specially designed motor fishing skiff, with a well for the fish, and a convenient little boat for taking my friends out for a sail as well as for fishing." And this is merely another one of the many phases where the motor boat contributes a generous share of comfort and convenience to a hard working man who has found it a big asset for his hours of recreation.

It would not be difficult to write an even hundred of examples where the motor boat has contributed big dividends in pleasure to men and women whom I happen to personally know. The modern internal-combustion motor has long passed its experimental stage and is now such a dependable and easily handled piece of machinery that the oil and grime and trouble, incidental to running a motor boat in the old days, has now been entirely done away with. The modern motor runabout is comparable with the motor car, because the motor is as easily handled in one as in the other.

One of the most enthusiastic motor boat owners of my acquaintance is a young woman who has a summer home next door to mine. She is the proud owner of a thirty-foot runabout powered with a six-cylinder motor which gives a speed of some 35 m.p.h. The boat is moored directly in front of the cottage and my neighbor spends much more of her time on the water than she does in the family motor car. Not long ago she told me, "Motor boating is a really splendid sport for women and anyone who can run a motor car can manage a boat just as well. The motor in my boat Blue Bird is of 125 h.p. but it runs as quietly as the one in father's Packard car. I do all the work myself, except overhauling, which I turn over to the chauffeur, and I never had to be towed home yet. It isn't a bit more messy or smelly than a car and just think of the miles and miles of clean and smooth water I can travel over without running over a single chicken, and I don't have to wear goggles to keep the dust out of my eyes or honk-honk my horn every other minute, either." All of which is quite true for the motor boat has many advantages over the car and the sport has many charms all its own and it is by no means necessary to cast the slightest disparagement at the motor car

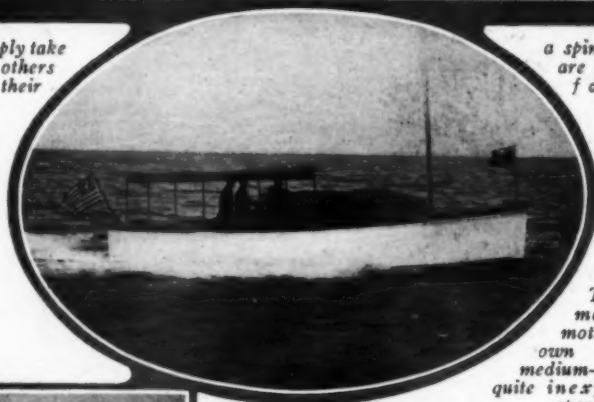
to popularize motor boating which is steadily growing as more and more out-door loving people hear the call of the water each month in the year. The sun never sets on this world-wide sport for when the craft is hauled out here in the North there are big fleets of pleasure boats in commission in Florida, California, Australia, Hawaii, and Timbuctoo.

Now the fullest measure of satisfaction gained from any out-door sport must necessarily depend to a great extent upon how the sport is enjoyed—how the game is played. Many who have been attracted to motor boating have been unfamiliar with boats and marine motors and have purchased indiscriminately to own poorly designed and badly constructed boats or have had the unpleasant experience of having worn-out or otherwise unreliable motors wished upon them. I know several who have been badly stung by purchasing shoddy boats and power plants. In one instance the outfit was second-hand—old and worn out. In another case the boat was still serviceable but the motor was

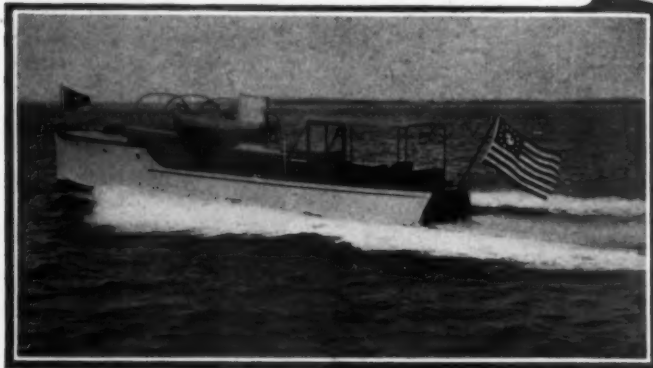


*Many simply take hours, others day with their*

*a spin for a few are off for the families*



*The great majority of motor boatmen own small- and medium-priced craft quite inexpensive to operate*

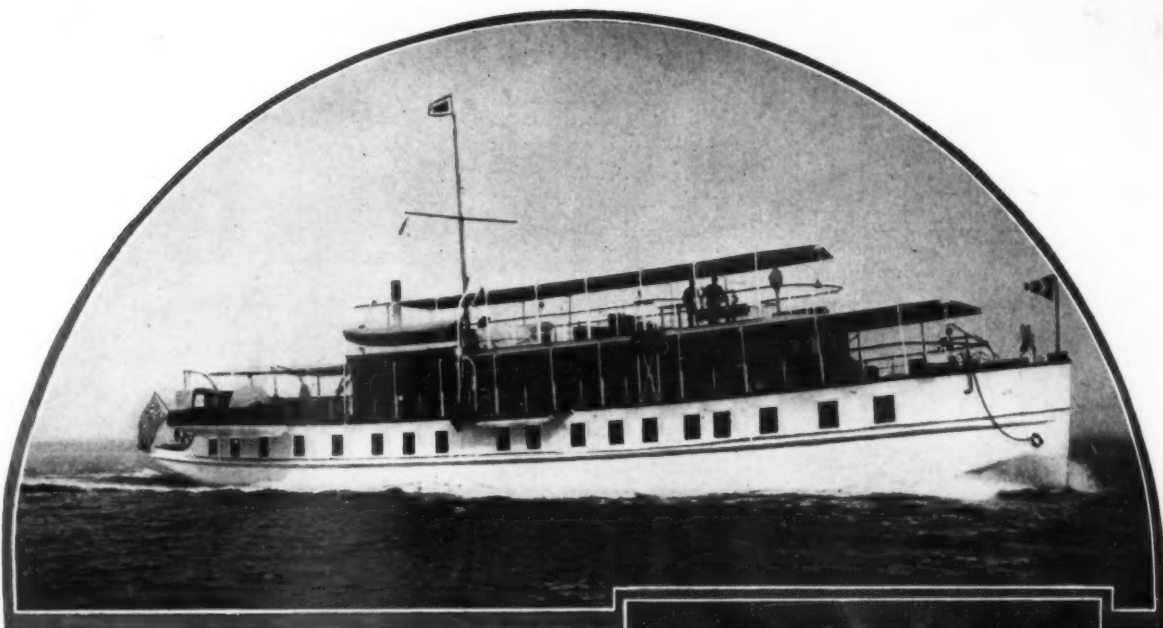


*There is a variety of sport in motor boating and the only qualification necessary to thoroughly enjoy it is a stretch of navigable water*

antique and fit only for the junk pile, and in the third case the boat and motor were new but cheaply built by a mushroom company who made a thrown-together outfit to sell for an attractive low price but not worth owning if given away. All of these men were discouraged with a poor outfit at the beginning but only one dropped out of the game and forswears boats forever more. This is mentioned to show that a boat and its motor should be purchased with discrimination, the same amount of buying-sense which the average person usually exhibits when buying anything for which he pays a good price. At one time in my checkered career I was interested in the automobile business and saw many cars change hands in the second-hand mart that were as thoroughly doped for sale as the worst example of horse

*(Continued on page 68)*





## The Trend in Motor House-Yacht Design

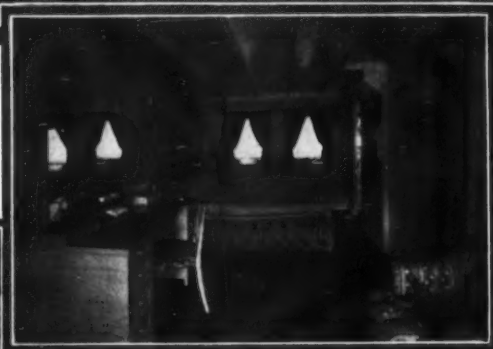
By Henry J. Gielow



Deck view on board Payne Whitney's motor houseboat Captiva

AT the mention of the word houseboat, our thoughts will instinctively fly to the "silver Thames," where houseboating has been a feature for many years, and where it is markedly in evidence during the height of the summer season, particularly during Henley regatta week. The mental picture presented is that of a barge with a light wooden superstructure, surmounted by an awning or shade deck, with comfortable and roomy accommodations within—a bungalow afloat, without motive power, moored at different points along the picturesque reaches of the stream.

Here in the United States, with our great distances, diversity of cruising grounds, ranging from the beautiful shores of Long Island Sound and the New England coast, down to the sunny lagoons, shallow streams, and inland waters of Florida, the splendid reaches of the Mississippi and St. Lawrence Rivers, and also the waters and picturesque shores of the chain of "Great Northern Lakes," from Duluth to the head of the St. Lawrence River, new conditions have presented themselves, requiring a craft combining the sea-going qualities of a good yacht with the more material comforts of a houseboat. Light draft is essential for winter cruising in southern waters, and a fair amount of speed and sea-going qualities are also required to enable



One of the many guest staterooms on Captiva

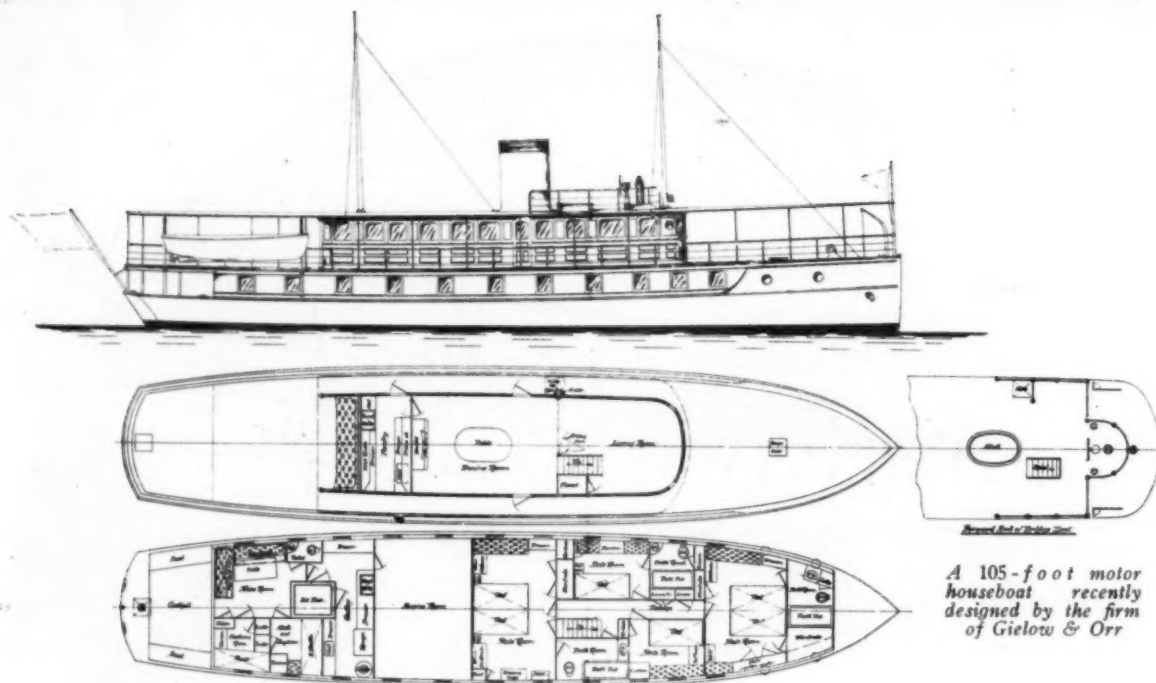
the owner to make the long runs between the winter and summer cruising grounds.

Conditions in Europe during the last four years have not been conducive to foreign travel, so that our busy Americans have sought rest and recreation nearer home, thus learning that aside from romance of antiquity of Europe and the Orient they are learning that in natural charms our great country stands second to none.

Florida, and the adjacent South, has become the "Mecca" during the winter months, and the social pleasures ashore have been rounded out by fishing, boating and kindred health giving pleasures, giving a more than ordinary impetus to houseboating, which is well attested by the fact that Gielow & Orr, of New York, Naval Architects, completed plans for seven houseboats for their clients, to be built during the summer months, and to be ready for use in Florida by the end of the current year.

The largest of these craft has the following dimensions: Length overall 120 feet 6 inches, length on load waterline 115 feet, beam 21 feet 6 inches, and a draft of 3 feet 6 inches. The next in size has an overall length of 115 feet, load waterline length 112 feet 6 inches, beam 21 feet, and a maximum draft of 3 feet 6 inches. Next comes a group of four boats ranging from 92 feet to 95 feet in overall length, with corresponding lengths of load waterline, the beam ranging from 18 feet to 19 feet, and all with a draft just under 3 feet 6 inches.

The living accommodations are designed to meet the individual requirements of the different owners, so no two are alike; but the arrangements in a general way comprise two double staterooms, each about 10 feet by 15 feet; two single staterooms, each about 7 feet by 9 feet; and three bathrooms; large wardrobes and ample locker and storage space for owner and guests; also excellent quarters for



A 105-foot motor houseboat recently designed by the firm of Gielow & Orr

officers and crew. A large ice-box and cold storage space, and liberal galley. The finish below will be in ivory white and tints. Deck houses will be of mahogany finished bright, and will contain living room 11 feet by 14 feet, dining room 11½ feet by 18 feet, and pantry, with dumbwaiter to galley.

The mechanical installation will be of the twin screw type, giving the boats an easy cruising speed of 12 miles, with a maximum speed of 13½ miles per hour. These boats will be provided with electric lighting plant, searchlight, and storage battery; they will be steam heated. The accompanying illustrations are representative of the type.

The smallest craft is of the following dimensions: Length overall 58 feet, length on load waterline, 56 feet 8 inches, beam 17 feet 6 inches, and 3 feet draft. This is an especially attractive craft for a small party, as it contains three staterooms, two being double, the larger one will be 8½ feet by 13 feet, the smaller one 7 feet by 10 feet, and the single stateroom will be

6½ feet by 8 feet, there will be one large bathroom and one lavatory and toilet room. The mahogany deck house will be 9 feet wide by 16½ feet long in the clear.

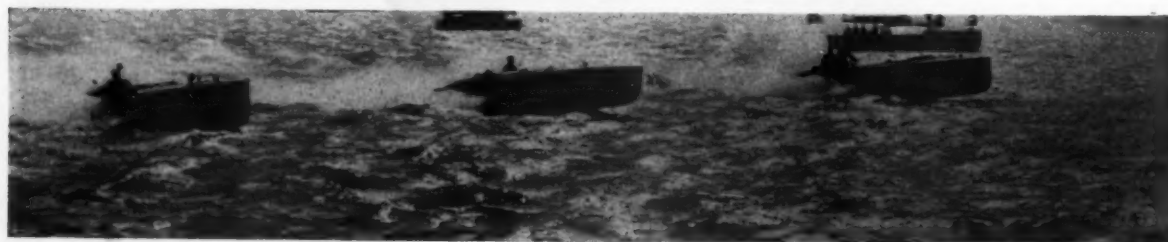
The propelling machinery will be a pair of gasoline engines, driving twin screws, there will be an electric lighting plant, storage battery, steam heating plant, etc. In fact, this craft will have all the desirable features of her larger sisters, but on a smaller scale.

In appearance these houseboats take something of the lines of a yacht of the larger type, with their large central funnels and fore and main masts, and look little like the mental picture of barge like houseboats that one generally conjures up. In fact, with their several decks from a distance they appear much like miniature sound and lake steamers of a well-known type. There are few port holes proper on houseboats, their roominess making it possible to use square lights or windows, which is, of course, a decided advantage.

The staterooms are divided by the engine-room, which is located just abaft the beam and extends clear across the boat.



The spaciousness of the rooms in a country home are surpassed by those on a modern houseboat



A scene which will soon be a common sight on many waters



Back row: Ensign Hendricks; Boatswain Gauff; Ensigns Douglas, Curtiss, Harsch, Dunn, Gray, Fox, Thomas, Welmore, and Still. Front row: Ensigns Breck, Weed, Schiek; Lieut. (j.g.) McNeill, Capt. Edward A. Evers Commanding, Lieut. Derby, Lieut. Glaubitz; Ensigns, Garthwaite and Hitzel

## The Making of an Ensign

Largest Naval Auxiliary Reserve School Conducted by Members of Chicago Yacht Club, Developed Naval Officers from American College Men

By Robert H. Moulton

Photographs by Lieut. W. M. Derby, Jr.

NAVAL activity a thousand miles from the nearest salt water sounds rather paradoxical. Sailors—trim, jaunty, clean-cut lads practicing the arts of naval warfare and talking the quaint jargon of the great fleet, where the tide neither ebbs nor flows, might seem at first blush sadly marooned in the inland State of Illinois.

But there is no actual anomaly. Up to a few months ago Uncle Sam was molding men in the native heath of the world's finest brain and brawn. He was taking men, mostly college graduates, and turning out, Gold Strippers, to officer the new merchant navy. He was doing this at the school known as the U. S. Naval Auxiliary Reserve School which occupied over half of Chicago's huge Municipal Pier that juts a full mile into Lake Michigan.

The Municipal Pier School, which was the largest Naval Training School outside of Annapolis, having at one

The students were given real training in seamanship and navigation on Lake Michigan. SP 216 is Hyac



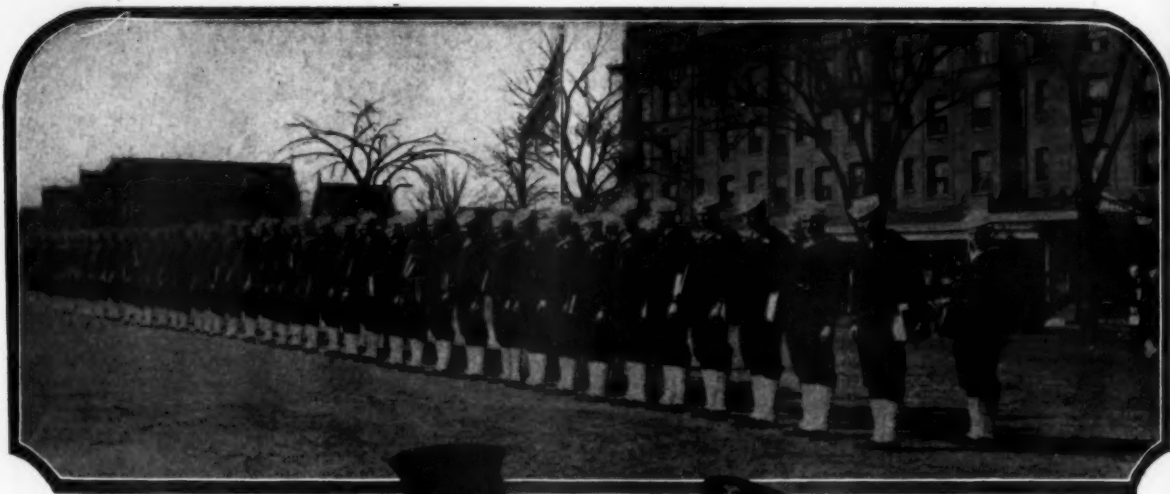
time an attendance of 1,750 and keeping an additional 450 to 600 men on the Lake Michigan ore boats, was the direct outcome of a meeting of members of the Chicago Yacht Club in December, 1916, when the subject of offering their services to the government, in case the United States was drawn into the war, was discussed. During the next two months they were assured by Captain Moffett of the Great Lakes Naval Training Station that he would need their best yachts for patrol and their best navigators as instructors, as some 9,000 officers would be required and only 2,700 were in sight.

On the night of March 7, 1917, this handful of men calling themselves, The Yacht Owner's Association of the Chicago Yacht Club, decided to create a school for the instruction of youths in navigation and kindred subjects the very next morning. This action represented the first civilian anticipation of the great naval change to



Going to recitation at the University of Chicago in charge of officers from pier





*Blue jackets at the University of Chicago in charge of the officers from pier. Note the copies of Bowditch under their arms*



*At the left: Ensign Dunn and Lieut. Sensen, two of the school's hardest workers*

come and proved to be more prophetic than expected.

On the following day was organized the Chicago Yachtmen's Naval Auxiliary, composed of all the water-going organizations of the city and its environs, and classes for instruction in navigation were immediately started in the clubhouse of the Chicago Yacht Club. The clubhouse was soon filled to overflowing, necessitating the taking over of the Edison building. This building in turn was quickly outgrown and the school moved to the Municipal Pier, its permanent home, where it occupied two floors, each 3,000 feet in length. From that time on until the signing of the armistice approximately 200 trained men left the school each month for a final two months' finishing course under the Supervisor, Naval Auxiliary Reserve at Pelham Bay, N. Y. By September, 1918, some 400 Ensigns and Lieutenants, products of the school, were on the ships plying between America and France.

In the beginning the expenses of the school were borne by members of the Chicago Yacht Club and when it moved to the Municipal Pier \$16,000 was donated by the Commercial Club of Chicago for equipment. In all, about \$30,000 was furnished by patriotic citizens of Chicago. The Chicago Board of Education rendered valuable aid to the school by furnishing numerous chairs, desks, blackboards and bookcases. Y. M. C. A. rooms were installed, as well as a sick bay, to which was added an ambulance, the gift of Mrs. Castleberry, of Chicago. In June the school was made part of the nation's armed forces, taking the name—United States Naval Auxiliary Reserve Force. Early in July regular enlistment became necessary before students could receive instruction at the school.

On August 28, Captain Moffett ordered the U. S. S. Gopher to move alongside the Pier and act as training ship for the students. Lieutenant A. M. Steckel, commander of Gopher, was thereby made commanding officer of the school. Others who served in this capacity later were Lieutenant-Commander L. R. Rutter, Lieutenant (j. g.) B. C. Getzinger, and Captain A. E. Evers.

From this base of operation Gopher took 450 students, fifty at a time, on a three weeks' cruise about the lakes, giving them actual training in steering, signaling, navigation, gunnery, and all the rudiments of the life that they expected to lead later on the sea. At the end of the three weeks' cruise Gopher landed its student squads at the Great

Lakes Naval Training Station and returned to the Pier for another load.

Gopher's program was kept up until November, the expense of the school, furnishings, and equipment other than that furnished by Captain Moffett, which was all and perhaps more than he could spare, being still borne by the Chicago Commercial Club. Leaders of the school work were William M. Derby, G. L. Weed, C. W. Schick, William T. Cooper, and Paul Springer, who were sworn in as naval reserve officers. On February 8 the Navy Department at Washington assumed the expense of maintaining the school, thus relieving the Commercial Club which had for almost a year gladly financed the patriotic enterprise.

With the opening of navigation in 1918 the Patrol Boat S. P. 216, the \$30,000 steam pleasure yacht, known as Hyac, which was owned and operated before the war by William M. Derby, was assigned to the Pier and made four trips daily, taking classes out into Lake Michigan and instructing them in actual steering, charting, compass reading, sextant work, and all the myriad traditions and practices of boats on the high seas. On landing from S. P. 216 the classes hastened to rooms on the Pier where other officers lectured, quizzed, and illustrated theories in manifold form.

When the student's two months at the Pier school were up he was sent to Cleveland where Ensign E. N. Wood, Assistant Supervisor, U. S. N. A. R. F., assigned him to a practice cruise of two months on some lake carrier—an iron ore, grain or lumber freighter. With another sailor—the jackies took this course in pairs—he embarked, becoming one of the crew, subject to orders of the ship's captain. On this ship he had instilled in him the discipline of the vessel, the Rules of the Road, the handling of large vessels, the construction of a ship, the management of the wheel, etc. For two months he led this life, submitting at the end of the trip, for examination, criticism, and grading, a detailed log of duty performed and subjects studied during the voyage. From the Master of the ship he received a report concerning his actions, which, together with his own drawings and notes, he presented to his officers at the Pier.

On reassembling at the school after their lake experience the learning of the students was systematized, and for another month they worked at the Pier. At the end of this month the students, after careful inspection, were sent to the finishing school at Pelham Bay.



# An Amateur Builds a Motor Boat

Gladine II, a 21-Footer, Was Built from the Ways Up by a Novice Who Used as His Only Guide Twenty-Four Numbers of MoToR BoatinG

By Walter W. Monroe

**T**HE word amateur is used in its truest sense. He realizes that there are many features about the boat Gladine II that would not be considered good practice. The experience, however, was very interesting and of course has brought many of the faults of the boat to the writer's notice.

The work was taken up for the pleasure of the employment, and the result has been a motor boat which has given the amateur and his family much pleasure and recreation in its use.

Usually when an account under the above heading is offered it is necessary to obtain several catalogs of knock down boat builders and after purchase and receipt of the material, "the amateur builds a boat." Perhaps the builder really does lay down the lines from plans furnished by some reliable naval architect, and while this method is recommended, it is not the way that Gladine II came into being.

The motor was built from the ground up, not from designs of the gas engine expert, but according to the best ideas of the amateur. Don't attempt to build a power plant in this way, unless you have plenty of stand pat, and are not in a hurry.

Access should be had to some of the more common machine tools, such as the engine lathe, planer, drill, miller, with index attachment for cutting the gears for the vertical timer shaft and the reverse gear, and a cylindrical grinder.

The only part of the work which the amateur would dare to claim a thorough knowledge of, would be pattern-making, consequently the making of the patterns for the engine did not suggest the pleasure that the machine work and boat building did.

The pattern making was turned over to students of Mechanical Engineering at the Worcester Polytechnic Institute, who were taking a course in pattern making under the direction of the amateur boat builder.

Many of the students found very interesting work along practical lines in the construction of these patterns. This practical work was carried into the foundry, which is a commercial enterprise employing journeymen molders, but connected with the above institute, so as to give the students practical instruction, and some of the students produced castings from

*A two-cycle engine with a governor operating a spark advance was built by the amateur*



the patterns which they made in their previous shop work.

The engine is of the two-cycle type, and some of its features are a governor operating a spark advance, and this same device breaks the primary electric connection on over speed, so that much of the tendency to race is avoided. An air heater is provided as a part of the exhaust manifold, and all the wiring is carried through copper tubes.

The ignition is the common jump spark operated by either dry cells or storage battery, the latter supplying electricity for the running lights.

Several weeks of the amateur's vacation were taken up with the machining of the engine parts, and views of the rough castings and completed engine are shown.

The model of the hull was made to 1 1/2 inch to the foot scale and was cut into at the location of the stations. Card-board was inserted in these cuts, carefully marked, and the form of the stations enlarged from these small patterns.

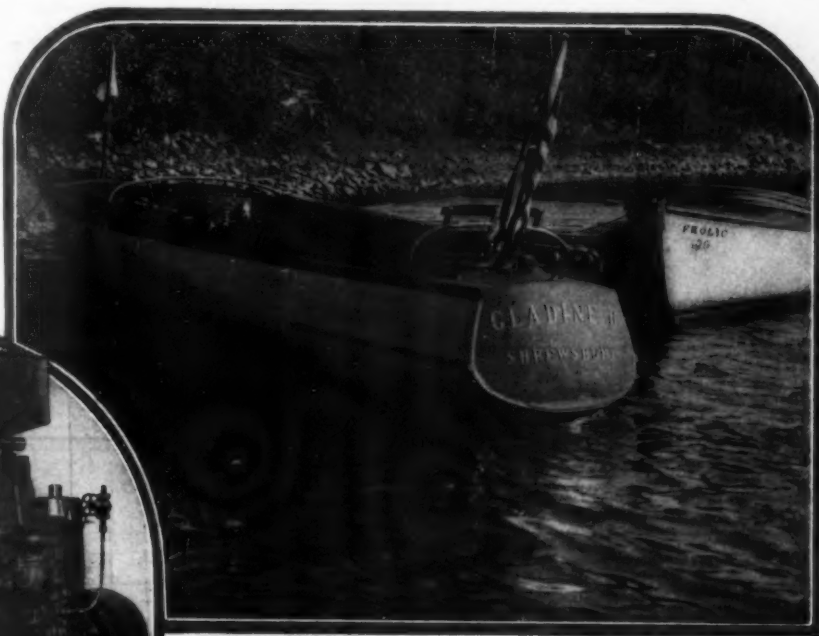
The keel and keelson were made from one piece of 2 1/4-inch oak. Mortises were made clear through the keel for the ribs, and a rabbet 1/4-inch deep was cut in the keel for the garboard strake.

A view of the inverted form with keel, engine bed and a few of the ribs in place is shown, as well as a view of the fully planked hull.

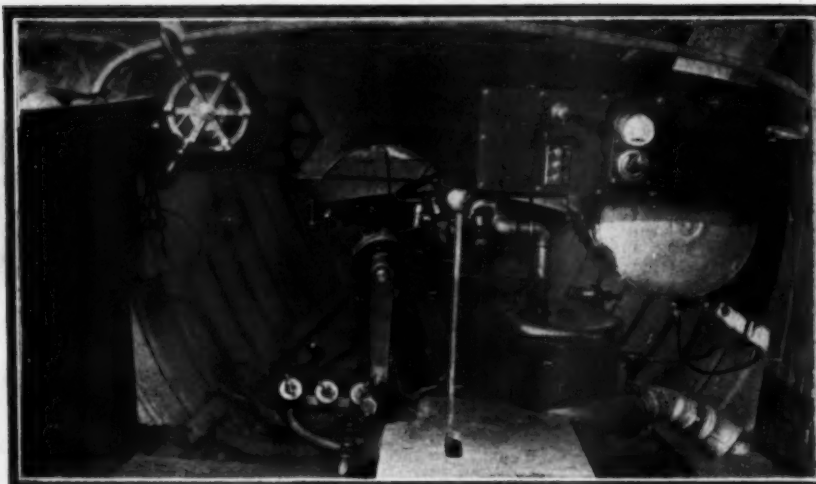
The planking was 9/16-inch white cedar fastened with brass screws and all the bolts were made of bronze.

The engine sills, which are 9 feet long, were placed in cuts in the stations before any ribs were bent in. After the ribs were in place these sills were dressed down flush with the ribs, so that the sills rest against the planking their entire length.

A spruce bilge stringer extends the entire length of the hull and is riveted to every other rib. The ends of the floor timbers are fastened to these stringers and also to the engine sills and keelson.



*The keel and keelson were made from one piece of 2 1/4-inch oak. Mortises were made clear through the keel for the ribs, and a rabbet 1/4-inch deep was cut in the keel for the garboard strake*



*For ignition the common jump spark was decided upon, and it was so arranged that it could be operated by either a storage battery or dry cells. This same storage battery was also used for supplying electricity for the running lights*

Under the engine three heavy oak pieces extend the full beam of the boat and are bolted to bilge stringers, sills and keelson. Over these cross pieces the wedge pieces which line the engine with its propeller shaft are fitted and bolted. A reverse gear was designed to fit an extension of the engine crankcase.

The cockpit is ceiled below the coaming with four panels on each side, which provide small but very handy locker space.

The stern seat with its lazy back can be removed entirely so as to give ample space to get at the steering quadrant. The seat also stores two standard life belts.

All the interior woodwork and deck are mahogany finished bright.



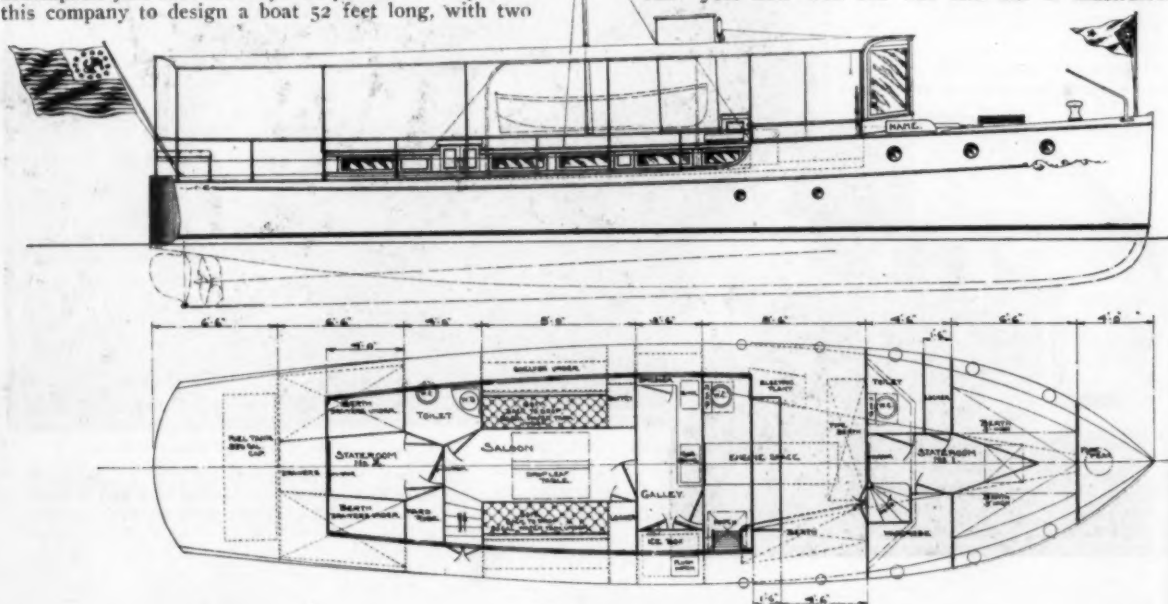
*Students of the Mechanical Engineering Department of the Worcester Polytechnic Institute who were taking a course in pattern making under the direction of the amateur boat builder were entrusted with the work of making the actual patterns—and they did a good job*

## Sixty-Foot Accommodations in a 52-Footer

COMPRESSING sixty feet of conveniences into fifty-two feet of space without cramming or overcrowding presents quite a problem in boat building, but the New York Yacht, Launch & Engine Co., of Morris Heights, N. Y., were called upon to accomplish just that recently. A yachtsman requested this company to design a boat 52 feet long, with two

staterooms and a saloon in addition to engine-room and galley.

Ordinarily this amount of accommodations usually requires all of 60 feet, but the expert draftsmen of the corporation were put on the job and the boat was laid out. Just how well she was laid out is illustrated.



# Graphic Navigation

An Illustrated and Diagrammatic Description of Methods by Which the Position of a Ship at Sea May Be Determined with the Use of Higher Mathematics Reduced to a Minimum

By Capt. A. G. Knight

## IV—DETERMINATION OF POSITION BY MEANS OF STAR SIGHTS

Note: This Series Began in February MoToR Boating.

**F**OR the student of practical nautical astronomy, or position finding at sea, by means of the heavenly bodies, the requirement may be stated as follows:

Ability to observe the altitude of any heavenly body (sun, moon, planet, fixed star), and to work the sight for position; to understand its value and to plot it on chart, and to determine position of ship by combining two or more position lines.

Use the method of Saint Hilaire, which may be regarded as standard up-to-date practice."—Lieut. Commander Gilbert P. Chase, U. S. Navy.

The First Point of Aries ( $\Upsilon$ ) is a fixed point in the heavens from which, with respect to the Earth, the angular distances of the Sun, Moon, Planets, and Stars have been measured and the results tabulated for use.

This angular distance is called Right Ascension and is always measured from Aries ( $\Upsilon$ ) toward the east to the body.

For instance, Right Ascension of the Mean Sun is the angle at the centre of the Earth between a line to Aries and a line to the Mean Sun, with Aries always to westward and the Sun to eastward, see Fig. 30.

Since Greenwich Mean Time is the Hour Angle of the Mean Sun from Greenwich (angle at the centre of the Earth between a line to Greenwich and a line to the Mean Sun measured toward the west from Greenwich), see Fig. 31.

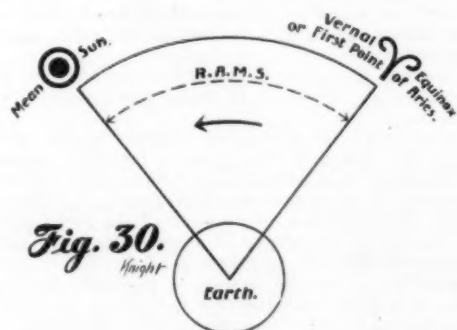


Fig. 30.

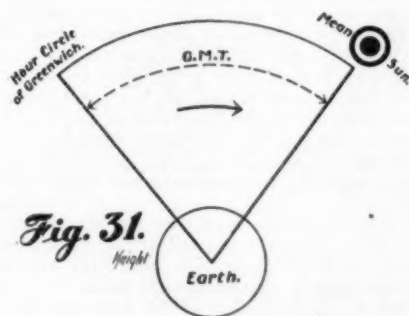


Fig. 31.

It follows that the sum of these angles will be the angular distance at the center of the Earth between Greenwich and Aries, and this is called Greenwich Sidereal Time (G.S.T.), see Fig. 32.

If we apply to Greenwich Sidereal Time, our longitude, subtracting if west, adding if east, we get Local Sidereal Time (L.S.T.), or the angle at the center of the Earth between the respective hour circles of ourselves and Aries, adding twenty-four hours if necessary to G.S.T. to perform the subtraction, see Fig. 33.

If we apply the Right Ascension of a star to Local Sidereal Time, subtracting the less from the greater, the remainder will be the angular distance between ourselves and the star, measured at the centre of the Earth, which is the Hour Angle (t), see Fig. 34.

### EXAMPLE

#### FIRST STEP—Tabulate the Data

Nov. 10, 1918, p. m.

Lat. by D. R. .... 40° 30' N.

Long. by D. R. .... 69° 25' W.

C. — W. .... 5<sup>h</sup> 25<sup>m</sup> 15<sup>s</sup>

C. C. .... 5<sup>s</sup>

I. C. .... 0

Height of eye .... 42 feet

Obs. Alt. ★ Hamal, 40° 4' 50", at W.T., 6<sup>h</sup> 12<sup>m</sup> 10<sup>s</sup> bearing east.

Obs. Alt. ★ Altair, 43° 57' 10" at W.T., 6<sup>h</sup> 14<sup>m</sup> 22<sup>s</sup> bearing S.W. by W.

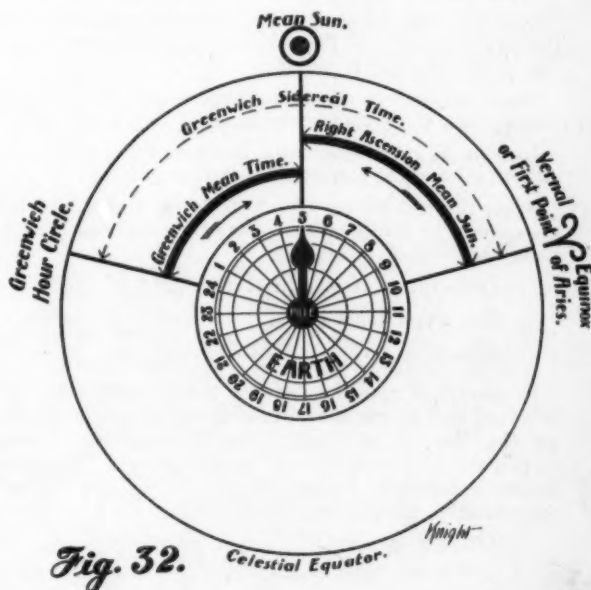


Fig. 32.



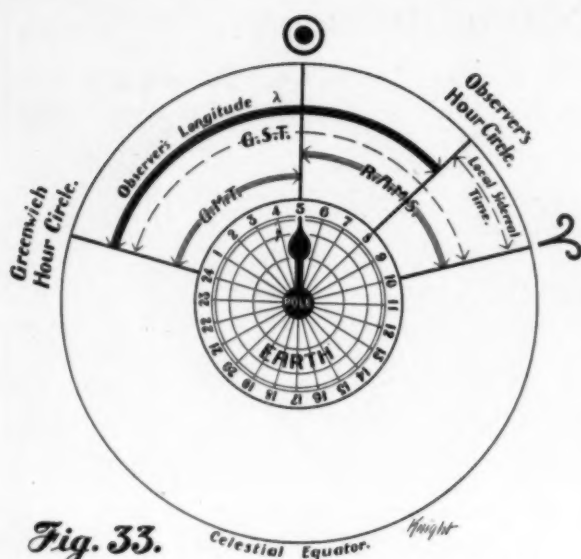


Fig. 33.

## SECOND STEP

Get the Corrected Altitude of both stars (h).

Use table 46 Bowditch, column for stars, giving the Mean Dip and Ref.

Stars have practically no diameter or parallax, owing to their tremendous distance from the Earth. Their discs appear as points of light and the angle due to parallax is negligible.

The identity of the observed star must be known to a certainty.

Fig. 35 is a sketch of the heavens as they might have appeared on evening of Nov. 10, 1918, at the hour and place of observation.

There must be sufficient light in the sky, at least low down, for the horizon to be distinctly visible.

Make observations as soon as stars of the greater magnitude are seen.

Choose stars that are neither close together nor at opposite sides of the heavens from each other.

Mentally note the pattern formed by stars grouped with the star observed (see Fig. 36), then find this pattern on a star chart and identify the stars.

Chart number 2,100, Constellations of the Northern Hemisphere, U. S. Hydrographic Office, is a good chart.

In table 46, column for stars, under 42 feet and for Obs. Alt. of 40° find the correction, — 7 feet 30 inches.

Apply this and get the Obs. h of the ★ Hamal, which is the quantity to finally compare with the calculated h of the same star.

Obs. Alt. ★ Hamal.....	40° 04' 50"
Correction, table 46.....	— 7' 30"
Obs. h.....	39° 57' 20"

By mental interpolation between the corrections for altitudes 40° and 45° get the correction for 43° 57', or roughly 44° the Obs. Alt. of Altair. The difference for 5° being — 11", for 1° it will be — 2" .2, or say — 2". Applying this to the correction for 45° which is — 7' 19", get — 7' 21", the correction for the Obs. Alt. of Altair.

Obs. Alt. ★ Altair.....	43° 57' 10"
Correction, table 46.....	— 7' 21"
Obs. h.....	43° 49' 49"

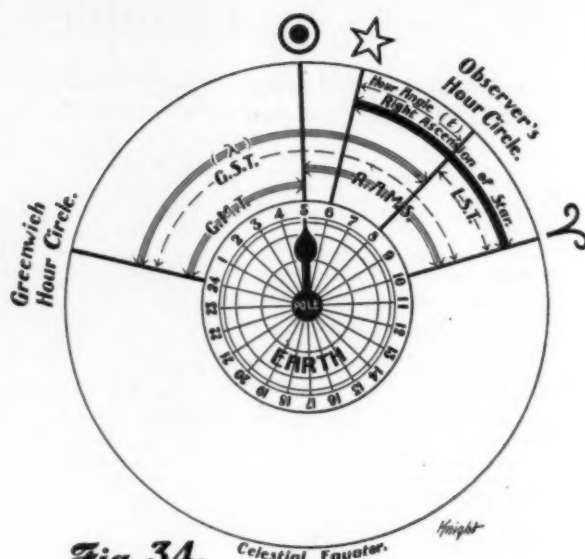


Fig. 34.

## THIRD STEP

Get the Greenwich Mean Time (G.M.T.). (See article on longitude in March issue.)

Watch time of first sight (W.T.) ★ Hamal. 6<sup>h</sup> 12<sup>m</sup> 10<sup>s</sup>  
Chronometer minus watch (C—W)..... 5<sup>h</sup> 25<sup>m</sup> 15<sup>s</sup>

Chronometer time (Chro. t)..... 11<sup>h</sup> 37<sup>m</sup> 25<sup>s</sup>  
Chronometer correction (C.C.)..... — 5<sup>s</sup>

Greenwich Mean Time (G.M.T.)..... 11<sup>h</sup> 37<sup>m</sup> 20<sup>s</sup>

Watch time of second sight (W.T.) ★ Altair 6<sup>h</sup> 14<sup>m</sup> 22<sup>s</sup>  
Chronometer minus watch (C—W)..... 5<sup>h</sup> 25<sup>m</sup> 15<sup>s</sup>

Chronometer time (Chro. t)..... 11<sup>h</sup> 39<sup>m</sup> 37<sup>s</sup>  
Chronometer correction (C.C.)..... — 5<sup>s</sup>

Greenwich Mean Time (G.M.T.)..... 11<sup>h</sup> 39<sup>m</sup> 32<sup>s</sup>

## FOURTH STEP

Get the Right Ascension of the Mean Sun (R.A.M.S.).

It will be found in the nautical almanac for Greenwich Mean Noon and must be corrected for time past noon if there be any.

A sidereal day (star day) is almost exactly the length of time taken by the Earth to make one complete revolution on its axis.

Owing to the Earth having a yearly motion around the Sun in the direction (east) which makes it necessary for the Earth to turn slightly more than one full revolution on its axis to bring the same meridian on the line from the center of the Earth to the center of the Sun each twenty-four hours, the solar day is longer than the sidereal day by about 3 minutes and 55.9 seconds, and it is on this account that the correction must be made for time past noon.

The R.A.M.S. is correct for G.M.N. of the date, but no Right Ascension has been allowed for the hours and minutes of solar time past noon, which is the widening of the angle between Aries and the Sun, continually going on; in other words, the increase of Right Ascension. See Fig. 37.

If in lieu of a star in the illustration, the First Point of Aries had been used (not a star, but nevertheless a fixed point in the heavens), the angle representing additional turn would be the Right Ascension of the Sun for the first day after Aries and the Sun had been in conjunction at the upper transit of some meridian. The Right Ascension of the Sun would then be 3 minutes and 55.9 seconds approximately.

This angle becomes wider as the Earth moves around the Sun from day to day, until at the expiration of a year the angle of Right Ascension will have reached the full twenty-four hours, the Earth will again be at the starting point and Right Ascension of the Sun will begin anew for another cycle.



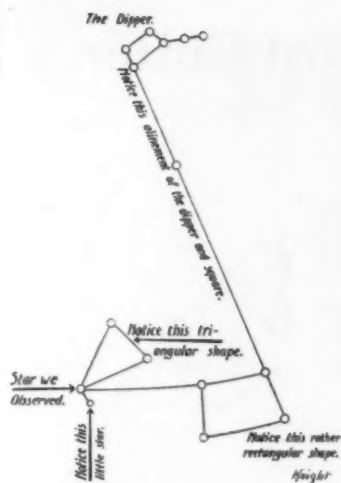


Fig. 36.

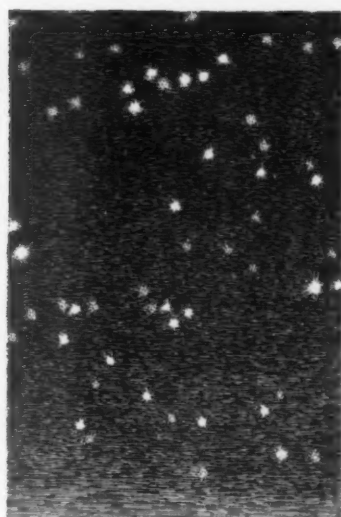


Fig. 35.

In the example there are 11<sup>h</sup> 37<sup>m</sup> past G.M.N. for which get the Right Ascension.

Use table III nautical almanac, corrections for hours and minutes to be added to a mean time interval to get sidereal time. This angle is the same as the increase in Right Ascension, thus:

R.A.M.S. for G.M.N. Nov. 10, 1918.....	15 <sup>h</sup>	15 <sup>m</sup>	20 <sup>s</sup> .1
Correction, table III, for 11 <sup>h</sup> 37 <sup>m</sup> .....	+	1 <sup>m</sup>	54 <sup>s</sup> .5
R.A.M.S. for G.M.T. ....	15 <sup>h</sup>	17 <sup>m</sup>	14 <sup>s</sup> .6
R.A.M.S. for G.M.T., without fractions of seconds .....	15 <sup>h</sup>	17 <sup>m</sup>	15 <sup>s</sup>

### FIFTH STEP

Get the Greenwich Sidereal Time (G.S.T.).

Add the Right Ascension Mean Sun for G.M.T. to the Greenwich Mean Time and the sum will be the Greenwich Sidereal Time, or the angular distance between Greenwich and the First Point of Aries measured in time. Thus:

G.M.T. first sight.....	11 <sup>h</sup>	37 <sup>m</sup>	20 <sup>s</sup>
R.A.M.S. for G.M.T.....	15 <sup>h</sup>	17 <sup>m</sup>	15 <sup>s</sup>
G.S.T. ....	26 <sup>h</sup>	54 <sup>m</sup>	35 <sup>s</sup>
G.M.T. second sight.....	11 <sup>h</sup>	39 <sup>m</sup>	32 <sup>s</sup>
R.A.M.S. for G.M.T.....	15 <sup>h</sup>	17 <sup>m</sup>	15 <sup>s</sup>
G.S.T. ....	26 <sup>h</sup>	56 <sup>m</sup>	47 <sup>s</sup>

See Fig. 32.

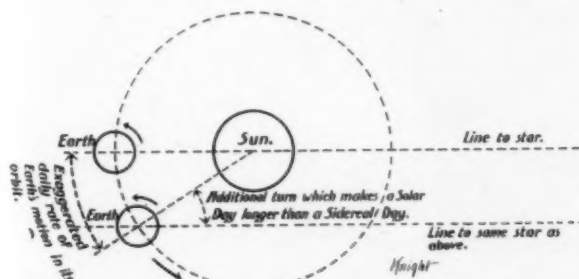


Fig. 37.

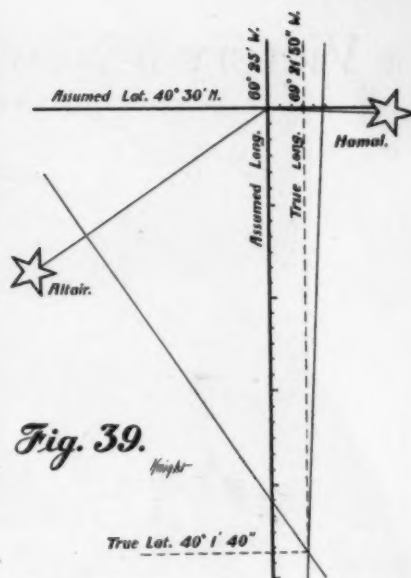


Fig. 39.

### SIXTH STEP

Get the Local Sidereal Time (L.S.T.).

Greenwich Sidereal Time minus Longitude in Time if west or plus Longitude in Time if east is Local Sidereal Time or the angular distance, measured in time, between the First Point of Aries and the position of the observer, thus:

15) 69° 25' W., assumed longitude divided by 15 reduces it to time.	
4 <sup>h</sup> 37 <sup>m</sup> 40 <sup>s</sup>	
G.S.T. first sight.....	26 <sup>h</sup> 54 <sup>m</sup> 35 <sup>s</sup>
λ W. ....	4 <sup>h</sup> 37 <sup>m</sup> 40 <sup>s</sup>
L.S.T. ....	22 <sup>h</sup> 16 <sup>m</sup> 55 <sup>s</sup>
G.S.T. second sight.....	26 <sup>h</sup> 56 <sup>m</sup> 47 <sup>s</sup>
λ W. ....	4 <sup>h</sup> 37 <sup>m</sup> 40 <sup>s</sup>
L.S.T. ....	22 <sup>h</sup> 19 <sup>m</sup> 7 <sup>s</sup>

See Fig. 33.

### SEVENTH STEP

Get the Hour Angles and Declinations of both stars.

Right Ascension and Declination of stars will be found in the nautical almanac for the year and first of each month. There is so little change in Right Ascension and Declination of stars that a few days more or less need not be taken much into account.

(Continued on page 62)

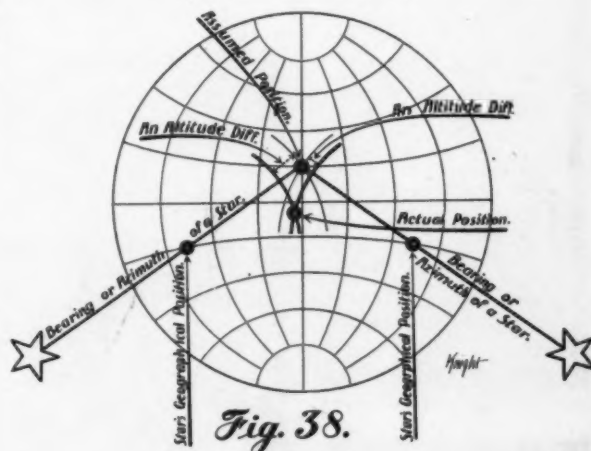


Fig. 38.

# Victory a New Type Coast Guard Cutter

Built with Lines Like a Destroyer—Long, Lean, Lithe



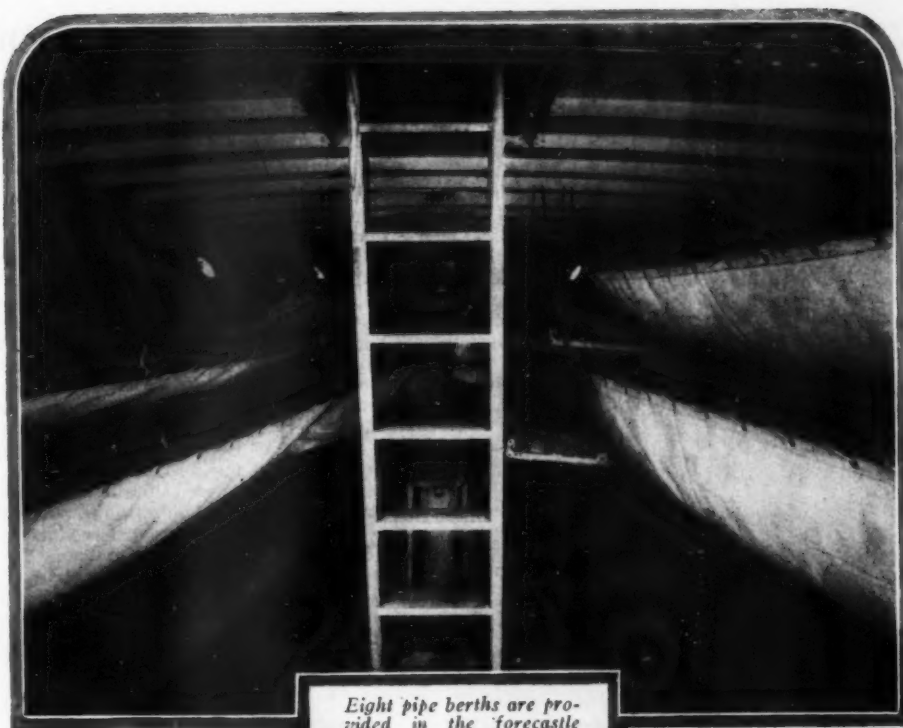
Victory is a 93-footer of almost complete steel construction and was built by the American Balsa Co. of Long Island City, N. Y., after plans by W. Gardner & Co., of New York City. Powered with Sterling engines she is capable of maintaining  $22\frac{1}{2}$  m.p.h. indefinitely. Presently she is operating between Quarantine and the Battery in New York harbor. Gun platforms have been installed. There is a wireless room and she is divided into four compartments by solid steel bulkheads so that she may be quickly converted into a fighting craft. The Sterling twin 300 h.p. motors were selected as conforming to Government specifications, which called for a power plant capable of retaining full power at a speed not in excess of 1,000 r.p.m. She has been pared down trim to the point of severity, and slips through the water with a rush that recalls the speedy larger destroyers.



Balsa wood which does not splinter is used in the living quarters

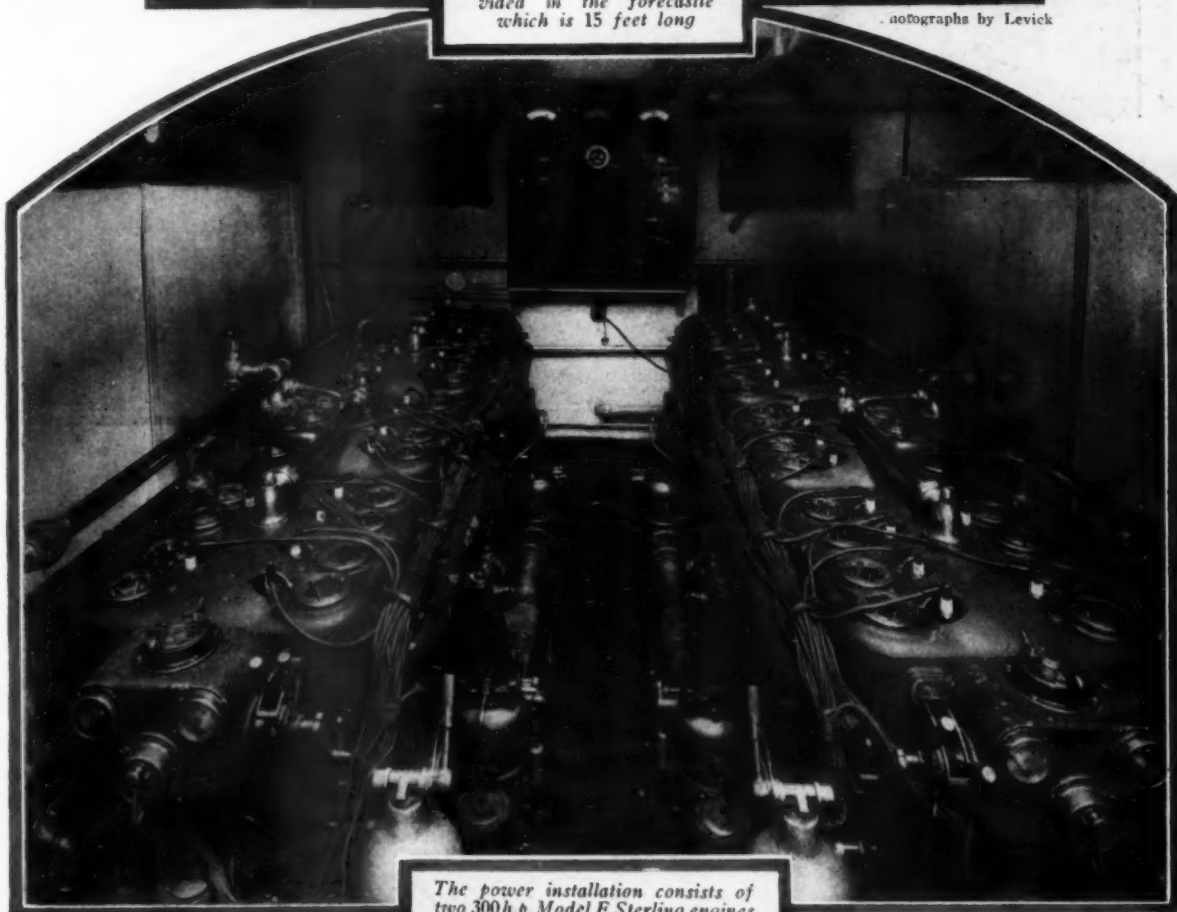


Besides the main cabin 10 feet long there are two state-rooms



*Eight pipe berths are provided in the forecastle which is 15 feet long*

Photographs by Levick



*The power installation consists of two 300 h.p. Model F Sterling engines*

## A Twenty-Eight-Foot Cruiser Good Enough for Anyone

**C**ONSORT II, or, as the name appears on the bow, it reads Idylease II, is one of the successful little cruisers built from the plans of F. S. Nock, of East Greenwich, R. I., which were published in *MoToR BOATING* some months ago. She was built, single handed, by Charles E. Grush, of Beverly, Mass., who has never outgrown his boating enthusiasm in more than forty years. He builds his own boats and claims that he has more sport in

with miniature electric light fittings at once impresses one with the fitness of the name Idylease II. The toilet is fitted with a Curtis closet and is also the location of a 6-80 storage battery, which is kept up with a 10-ampere Apple charging dynamo. Electric lights, klaxhorn, binnacle, switchboard, cabin, and trouble lights are supplied from this source and plugs and outlets are found in every nook and corner.

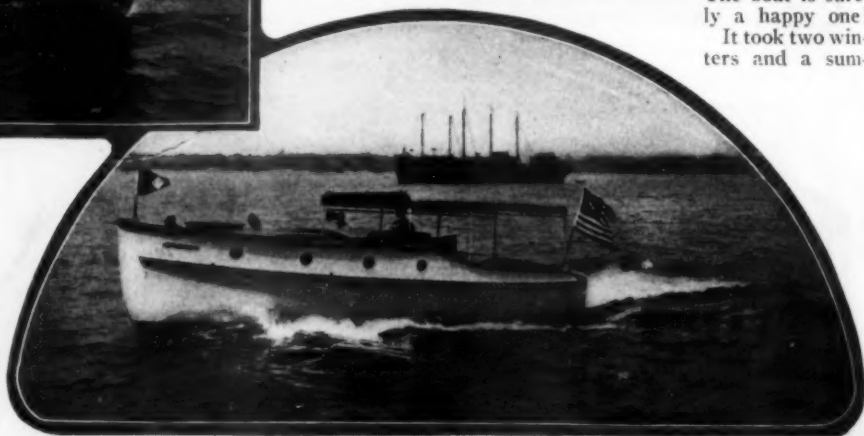
The power plant is a 4x5, four-cylinder, four-cycle, valve-in-head Erd motor having a Joe's gear, Kingston carburetor, and Dixie magneto with an impulse starter, so that no battery or cautionary setting of the spark is necessary when starting. Very satisfactory results have been acquired with a 20-20 type "A" Columbia wheel turned at 715 r.p.m., this giving about 8½ m.p.h., but it is an easy matter with the power in reserve to turn up another hundred and get nine miles. Two twenty-gallon gasoline tanks under the cockpit seats are the Koven lead coated product which seems to be preferable to those which are galvanized on account of the lack of chemical action, for the tanks are always clean on the inside; as for the exterior, being lead, it is inclined to soil everything with which it comes in contact, but a coat of paint fixes that. An awning completes the outfit and it is not an unusual occurrence to have four generations and a graphophone from the same family spending a day on the water.

The boat is surely a happy one! It took two winters and a sum-



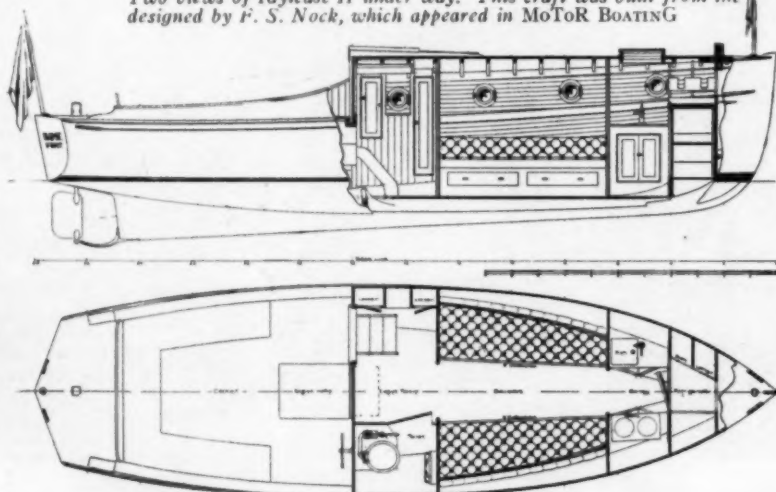
building than running them afterwards; in fact he is acknowledged to be a past master among amateur boat builders.

The boat is a sporty, well-balanced little cruiser and the picture tells the story from the outside. Inside, beginning at the bow, is the customary chain locker, next is the galley which has a porcelain enameled sink with running water supplied from a tank under the cockpit floor, a two-burner oil-stove furnishes the hot stuff, a gem of a white metallic ice-box furnishes the cold stuff, while lockers in every conceivable place furnish the canned food and supplies. The entire cabin is finished in white enamel with mahogany trim, the green kapoc filled, corduroy cushions on extension berths, with carpet to match, together



Two views of Idylease II under way. This craft was built from the designs by F. S. Nock, which appeared in *MoToR BOATING*

plans of Consort II,



Arrangement plan and profile of the 28-foot Idylease II

mer to build the boat, using only spare time, not any being taken from regular hours, and the owner considers that the bending of the ribs, which had to be steamed and placed during the short working periods, was the longest and most tedious part of the work, but after that the work was light and pleasing. He took pride in doing it.



# SMALL MOTOR BOATS

## Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions Submitted for July Prize Contest

1. How can one determine the power of his gasoline engine with a fair degree of accuracy from bore, stroke, and r.p.m.?

(Suggested by L.B.C., New London, Conn.)

2. Describe and illustrate a simple, practical arrangement for pumping out bilge water by means of the circulating pump on the

engine, taking special care to provide for elimination of the danger of clogging any part.

(Suggested by C.E.B., Fall River, Mass.)

3. Suggest the most desirable interior arrangement plan for a 32-foot cruiser using diagrams, if necessary.

(Suggested by J.M.R., Newark, N. J.)

### Rules for the Prize Contest

ANSWERS to the above questions for the July issue addressed to the Editor of *MoToR BoatinG*, 119 West 40th St., New York, must be (a) in our hands on or before May 25; (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' name and addresses.

The name will be withheld and initials used. QUESTIONS for the next contest must reach us on or before May 25. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions below, any article or articles sold by an advertiser advertising in the current issue of *MoToR BoatinG* of which the advertised price does not exceed \$25, or a credit of \$25 on any article which sells for more

than that amount. There are three prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer all.

For answers which we print that do not win a prize we pay space rates.

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of *MoToR BoatinG*, of which the advertised price does not exceed \$5, or a credit of \$5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us. The winners should be particular to specify from which advertisers they desire to have their prizes ordered.

## How Shall I Obtain a 25-Foot Cruiser?

Answers to the Following Prize Question Published in the March Issue

*"Which is the best way to obtain say a 25-foot motor boat? Buy completely equipped; buy parts and assemble; have built to order, or buy second-hand and remodel? What has been your experience?"*

### Choose According to Your Purse

(Prize Winning Answer)

PURCHASING a boat is entirely dependent upon yourself and your pocketbook. If you have the money and want the boat exactly to your needs you may have it designed and built to order. Put up by a reputable builder, such a boat is all that could be desired, and you can demand anything up to the best that man can produce.

If you have the money and little time, if you do not want to bother with building, or if you live a good distance from the water, or have no place to build, and still want a boat strictly to your ideas, the built-to-order boat cannot be surpassed.

But perhaps you are not as particular as all that. You want a good boat, but do not mind its having been used a bit; you have no place to build and yet do not feel as though you could afford a new boat.

No worry at all. You may get a second-hand boat that will fill the bill.

Just how good your chances are of getting what you want at the price you want to pay will depend mostly on size.

Below thirty feet boats are so much in demand that it is hard to strike a real bargain. This is especially true at this particular time.

These sizes (from 20 to 30 feet) are about what the general public wants, and so there is no real use in letting them go at anything less than the market price.

Occasionally one will find such a case as I did just a short time ago, and it pays well to watch a bit for them.

Think of getting a sound, well turned, 25-foot auxiliary, completely found, for \$125.

The owner had but one leg, and being tired of depending on friends, was ready to let her go at any price. But these finds are extremely rare.

As you go above thirty feet the second-hand price on a boat falls rapidly in proportion to her original cost, and some real bargains can be found without much trouble. This is more true than ever where the first owner has had a great deal of special work and finish put in. The chances

of any other man being willing to pay the price for them again are rare and often a boat of the finest construction may be had at less than half of what it would cost to build her new.

In the end, perhaps, for the man who likes to putter with tools, the best way of getting a really fine boat is to build from the knockdown frame.

Throughout the country a goodly number of firms are engaged in the business of turning out all types and sizes of boats in this form, from the 10-foot flat-bottomed dink to ocean-going yachts of close to 100 feet.

These frames are for the most part completely assembled at the factory, and then taken down to facilitate shipment.

All the machine work is done; heavy parts such as keel, stem, deadwood, and knees, are fully fitted, ribs bent to exact shape, fitted and beveled, and in short the frame finished in every detail.

It is only the matter of a few hours to bolt the heavy parts together and fasten the frames in place (each fourth or so of the latter being stayed so that it must hold its shape) of even a fair sized cruiser.

The planking is put on according to the method advised by the particular firm the frame was bought from and it is really the only tedious part of the whole thing. The ways of planking vary somewhat, but all are simple and give you a sound vessel.

The interior, and here lies the real beauty of the system, can be arranged to suit yourself in every detail; or you can choose one of the several hundred current layouts adapted to the size of your craft.

As a last word, do not get caught on the so-called standard frames. These are little more than the raw material. The ribs are bent over a few molds and all the setting up, fitting, etc., must be done by the purchaser.

Not that they are a bad thing, but for the average man they give too great a chance of not turning out a good boat unless he knows what he is about and has done some boat building before. For the experienced they are fine.

C. P., Chicago, Ill.

## Buy a Second-Hand Boat

THE question brings to mind the threadbare query whether it is better to build a house or buy one ready built. If cost and time impose no limits I cast my vote without hesitation in favor of having it built to order—whether it be a house or a 25-foot motor craft.

In either case I would proceed along similar lines. I would consult an architect experienced in designing the general type of boat I required. Having arrived at the design, I would place the order in the hands of a responsible and experienced builder, stipulating that the construction be under the supervision of the architect and myself. I would insist on a time clause in the contract.

The choice of an engine would be the result of conference with architect and builder, and would be installed by the builder under supervision of architect and service department of the engine dealer. Other fittings and equipment would be selected and installed by the same method. I would lay special emphasis upon the selection of the propeller.

I would insist upon a most thorough trial trip in both smooth and rough water, with architect, builder, and engine representative present. In short, I would give just as much care and detailed thoroughness to the purchase of a 25-footer as to a 125-footer.

I have owned three motor boats, of 22, 25, and 28 feet length, respectively, and they have all been bought second hand. To all of them I have made changes and improvements, varying from minor details to the substitution of a good reverse gear for a poor reversible propeller. The engine of one boat I sent to the factory for a complete overhaul before starting on a five months' cruise. One of the boats I used six years and then sold for \$25 less than she cost me. The second I ran about 3,500 miles, then accepted an offer which was \$75 more than I paid for her. Owing to a serious accident, I had to take a loss of about \$100 when I sold the third boat.

Having therefore had the use of a boat for about ten years at an aggregate original cost of \$125, I am an enthusiastic advocate of the policy of buying second hand, provided you know something of hulls and engines, and are able to find real value in a boat which approximates your requirements as to size, speed, seaworthiness, and accommodations. If you are a New England Yankee so much the better.

Don't forget that a good boat in good hands depreciates far less rapidly than an automobile. But don't buy a second-hand boat without a most thorough examination of the hull both in and out of the water, and of the engine both inside and in operation. It is risky to buy a hull unless you know the age and the builder's name, and can get under the paint in your examination. Don't buy an engine of unknown make or obsolete model.

In regard to buying parts and assembling yourself, I would not recommend this course as an economy or unless you have plenty of time and enjoy building better than operating a boat. As for buying the completed boat ready-made and completely equipped, in other words, a stock boat, it is getting easier to get something really worth while by this means, but it is not very often that you are able to find a stock boat which meets all your requirements.

R. B. B., Larchmont, N. Y.

## If You Have Patience Alter an Old Boat

THE first thing that you must decide, is just what kind of boat you want, and see, with your mind's eye, how it will look. Should you be able to find the boat finished, and at a reasonable price, buy it, but you seldom find a boat fitted to suit you. My experience was as follows: I owned an 18-foot open boat, and wanted a glass cabin, but could not find any to suit me, so looked around for something to buy and remodel. I found, in July, a boat 28 feet long and 8 feet beam, that was in fine condition, and at the price of \$150. This boat had a two-cycle, single-cylinder engine installed, also a cockpit, with a standing roof over half of it. I used the boat until the fall, so that I would not lose that time in rebuilding, when I could have pleasure in boating, and started to remodel it in November.

First I contracted with a small boat builder to put on a complete cabin for me over the cockpit, out of oak, with

drop windows, at the price of \$200. This was 15 feet long, 6 feet 6 inches wide. Next I bought a four-cycle two-cylinder engine at \$150 and installed same at a cost of about \$12. My main cabin forward was 9 feet long, and my engine room 6 feet long. I also had a small toilet room on one side (as shown in the drawing) 4 feet long and 2 feet wide. I had a flush deck aft, covered with an awning, which I installed myself at a cost of about \$20 and a front deck 7 feet long; the after deck was 6 feet. Decks were covered with canvas, and painted a dark lead.

Installed a generator at \$20, made my own switchboard at a cost of \$12, wired the boat myself at a cost of \$15, and bought a battery for \$20. Cushions, paints, varnish, toilet, steering gear, searchlight, and oilcloth cost \$60. Total of all of the actual cost, not counting my own time, was \$659 less \$60, the price that I got for the old single-cylinder engine, making a net cost of \$599. I had one of the best equipped boats of her length, more room than boats much larger, and thoroughly seaworthy, due to her good beam. In conclusion, I want to say that it takes a good amount of patience and work on your part, but it pays in the end, to remodel an old boat, just to your liking.

My greatest help, however, was in reading MoToR BOATING and selecting a good deal of the outfit from the advertisements found therein.

C. G., Baltimore, Md.

## Each Individual Must Judge According to His Wants and Means

THE correct answer to such a question would be different for each individual according to his wants and means.

It is possible to get a very good boat Knockdown with the plans and material to complete the outfit. This method requires a great deal of time, patience, and skill for the builder. The man who considers himself a fairly good carpenter in nine cases out of ten is doomed to failure when it comes to boat building. When the boat is completed, it will probably look like a home-made job. The builder would have to buy his motor and fittings and work out all the little details to finish up his outfit. It would require a good deal of experience to do this right. The total expense under favorable conditions would be about seventy-five per cent the cost of a complete boat and probably not a satisfactory one.

This method would be the most expensive way to get the desired boat. If a man wants a boat specially suited to his own individual needs and can afford it, this method would be the most satisfactory. It would require special plans and consequently cost more. The average man, with limited means would not feel inclined to choose this way.

By looking around, it might be possible to find a second-hand bargain that would fill the bill. In buying such a boat, it requires a pretty keen judge to make sure the boat is sound and seaworthy. Then comes the question of remodeling. This would mean more or less careful planning and the services of a boat builder. When the boat is overhauled and refitted, the expense would probably be a little less than a new boat, depending on the condition of the power plant and amount of work necessary. I have always found it is far more satisfactory in the end to start with a new outfit than to buy second hand and remodel provided there is not a great difference in cost.

There are a great variety of boats on the market sold completely equipped. These boats are tried out models. They embody the latest designs which have proved practical and popular. All the details have been carefully planned. The builders have used their best efforts to make the boats successful. Such boats are planned for quantity production and the cost is therefore much less than special models. Our average man should go over these boats and choose one which suits his requirements. He will be surprised to find he can get his boat ready made for the amount he is prepared to invest. When he buys this way, he knows he will get a satisfactory outfit. He has the builder's reputation back of his purchase. He does not have to worry how his boat will look when it is done, whether the hull is sound, or the power plant in good shape. The logical answer to his question, how can I best secure a 25-foot motor boat, is to buy completely equipped.

J. B., Oak Park, Ill.

# Windshields That Are Both of Glass or Canvas

Answers to the Following Question Published in the March Issue

"Describe and illustrate the construction of the best windshield, glass front or other protection, for the forward end of the cockpit of a small raised-deck cruiser. Also tell why you prefer it."

## A Torpedo-Chaser Model

(Prize Winning Answer)

THE type of windshield I consider the best and most serviceable for a small raised-deck cruiser is practically the same as one which has been in use for several years on the Bliss company's torpedo chasers.

Of course, the size of many of the parts depends on the individual boat, however, the general plan in each case is the same. The height of the shield should be at least 6 feet above the cockpit floor to furnish the helmsman good protection. The front of the shield consists of  $1\frac{1}{4} \times 2\frac{3}{4}$ -inch oak, which is rabbetted  $\frac{1}{2}$  inch to allow the glass to fit in, as shown in Fig. 1; a quarter round molding then holds the glass in place and furnishes an easy method of replacing breakage. This is unlikely as 32-ounce glass is used. The bottom of the frame is rounded to fit the crown of the deck and is cut away just enough to allow the hatch to slide freely. The frame should be placed 2 or 3 inches ahead of the aft end of the hatch when it is shoved way forward, so that at no time can the hole cut for the hatch be left open. The sides of the shield are made of  $\frac{3}{4}$ -inch pipe, either galvanized or brass bent to the indicated shape.

On each side of the frame holding the glass the pipe runs vertical and is drilled and countersunk for four  $2\frac{1}{4}$ -inch No. 16 wood screws. These make a good firm fastening between the front and side frames. At the top of this pipe is a 90-degree elbow and from there the pipe takes a slight bend and then runs parallel to the sheer for about 3 feet. It is then bent on a 1-foot 9-inch radius and then drops straight to the cockpit coaming. The ends of the pipe, both on deck and where it meets the coaming, are fitted with  $\frac{3}{4}$ -inch standard pipe flanges. The flange on the coaming can either be shimmed up to overcome the rake, or the pipe can be bent a little at the end to fit the flange. The canvas sides are 8-ounce duck grommeted so that they can be laced tight to the pipe. The bottom is laced through holes in a cleat.—U. L. W., Greenport, N. Y.

## A Windshield and Storm Curtain Combined

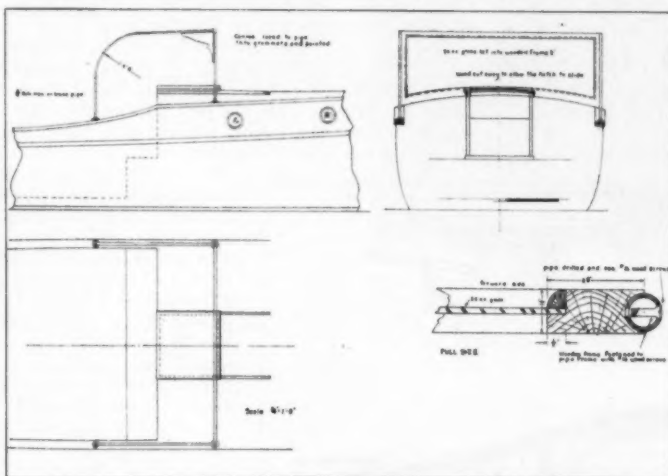
TO be of most use on a small cruiser the device for protection from the elements must have the following characteristics:

- 1, The windshield must be easily and quickly put in place;
- 2, it must be easy to stow;
- 3, it must be strong enough to withstand heavy winds;
- 4, it must not interfere with the navigation of the boat;
- 5, it must not interfere with clear vision during a heavy rainstorm or fog.

The combined windshield and curtain here described possesses the above advantages. It is merely the forward curtain of a raised-deck cruiser with oblong windows cut in it; fitted to these windows are detachable panes of celluloid, so constructed that they may be put in place or removed in a few moments.

When beginning to make the shield the forward curtain was put in place and a convenient height for the windows marked with a lead pencil. As these apertures were cut the inner edges were turned back and sewn with two rows of stitching for reinforcement. The pieces of celluloid used for window panes are 2 inches longer and 2 inches wider than the windows; around their edges was sewn an inch strip of canvas, also with two rows of stitching. To hold these window panes in place large snap fasteners are used which are similar to the snap fasteners of an ordinary glove; one at top and bottom and two on each side of pane. Sockets for the fasteners are placed on the reinforced edges of the windows. These fasteners can be obtained from harness makers and must be put on by them because a small machine is necessary to do this. Such fasteners are so secure that the panes will not blow out in a strong wind. When the storm curtain is not in use it is rolled up and held in place in the usual manner.

Removable windows have one advantage over a fixed glass windshield. When running in a fog or a heavy rain, and mist or raindrops on the pane obscure the vision, one window pane may be



U. L. W. combines both glass and canvas in a windshield that was found highly satisfactory on the torpedo-chasers

for reinforcement. The pieces of celluloid used for window panes are 2 inches longer and 2 inches wider than the windows; around their edges was sewn an inch strip of canvas, also with two rows of stitching. To hold these window panes in place large snap fasteners are used which are similar to the snap fasteners of an ordinary glove; one at top and bottom and two on each side of pane. Sockets for the fasteners are placed on the reinforced edges of the windows. These fasteners can be obtained from harness makers and must be put on by them because a small machine is necessary to do this. Such fasteners are so secure that the panes will not blow out in a strong wind. When the storm curtain is not in use it is rolled up and held in place in the usual manner.



O. R. F. devises a combined windshield and storm curtain with removable windows so that a clearer observation may be made in a fog or rain



removed and clearer observations can be made without discomfort.

Such a storm curtain does not interfere with ingress to the cabin through the hatchway; the hatch can be moved when the curtain is in place.

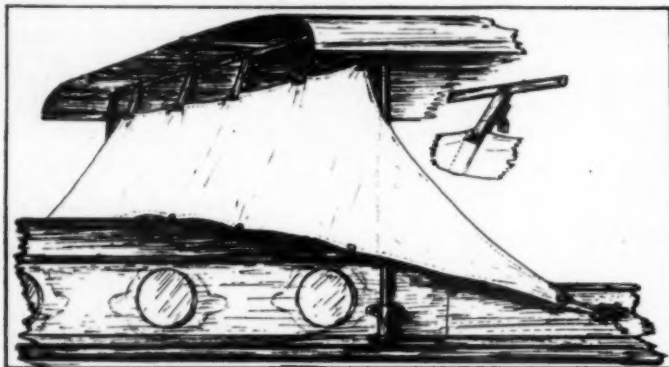
The windshield illustrated here was used during last summer on a 36-foot cabin cruiser, giving perfect satisfaction. Fig. 1 shows the appearance of the curtain when looking aft. Two of the celluloid windows are in the foreground. Fig. 2 shows the view looking forward; the windows above the helmsman's seat have been removed and one is shown leaning against the curtain. The canvas awning was removed when the latter photo was taken. It will also be noticed that strips have been sewn just above the windows as an added protection against the possibility of panes blowing out. Both Figs. 1 and 2 were photographed during a heavy rain storm.

The scheme here presented for a windshield and storm curtain has the additional advantage of being made from the usual equipment with only slight expense.

O. R. F., Brooklyn, N. Y.

### A Canvas Apron Best

**T**HE advantages of a glass windshield on a small cruiser are overbalanced by the disadvantages. If made in one piece it is bulky and liable to breakage both from boarding seas and other causes. If made in sec-



Only in a beating rain will the man at the wheel be dampened with this canvas apron of J. E. M.'s in use, and then not enough to be disagreeable

(At right) J. C. H.'s windshield can be tilted to any angle affording whatever ventilation desired and when down in position affords maximum protection against wind, sea or rain. When slid back it is entirely out of the way

tions the supporting work must be flimsy, otherwise there is a suggestion of top heaviness.

Being near the surface of the water a glass windshield is often rendered useless with salt spray just when its use is most desired. The rapidity of motion often causes it to be a mirror to the helmsman.

Hence, the writer uses on his cruiser the wind and rain apron here illustrated. It fulfils all the duties of a glass shield with none of its disadvantages and has the added advantage of being easily stowed away when not needed.

The method of construction is seen from the drawing. Eight-ounce canvas is best adapted for the work. As will be seen the upper edge is fastened to the pipe awning with straps as shown in the insert, while the bottom edge is fastened to the cabin roof with snap hooks engaging screw eyes.

Celluloid was first used as a topping, but it scummed over in rainy weather and became salt incrustated with spray in sunshiny weather, so it was discarded. Only in driving rains will the rain find its way to the helmsman and then by shortening the straps the amount will be almost negligible. The wind, too, is deflected by the slant of the canvas. If the helmsman wears the conventional yachting cap, adjusts the apron so that the upper edge is practically on a level with the vizor, it will be difficult for him not to imagine that he is behind a glass windshield.

J. E. M., New London, Conn.

### A Windshield that Can Be Tilted to Any Angle

**A** VERY simple and practical windshield for the front end of a small raised-deck cruiser can easily be made by carefully following these instructions and drawings.

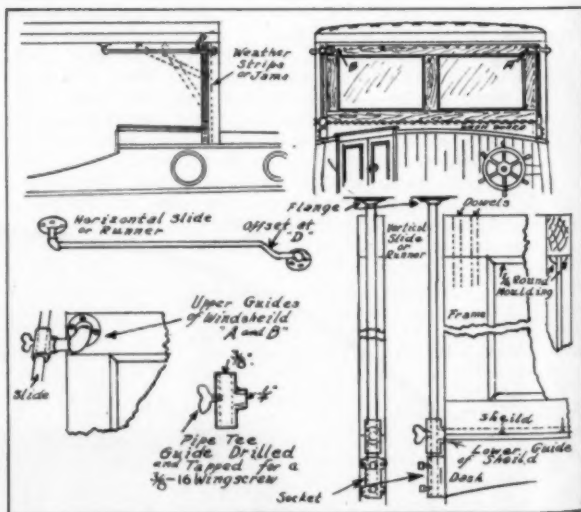
The first step is to fasten weather strips or jams against the front awning supports and across the top of the awning from post to post. Then across the deck from post to post make a dash-board, preferably of 1-inch oak, so that the windshield when down rests on the dash-board and against the jams or weather strips.

The windshield frame is made from the same size stock as the dash-board. If a mortise and tenon joint proves too hard to make, a good solid joint can be made with the use of  $\frac{1}{2}$ -inch dowel pins as shown in the sketch. The windshield frame should be made to the size representing the space between the awning supports, the dash-board and the top jam or weather strip.

The lower edge of the windshield should be gouged out so that a piece of  $\frac{1}{4}$ -inch iron pipe will lay in it to half its diameter. The dash-board edge should also be gouged out to clear the pipe so that the edge of the windshield and the dash-board form a good tight joint. The shoulder against which the glass lays can be cut into the frame if the tools

are handy, but  $\frac{1}{4}$ -inch round molding answers the purpose as well and requires less skill to make.

The runners, or slides, and guides for the windshield are made from  $\frac{1}{4}$ -inch pipe and fittings. The upper, or horizontal, slide is made as shown in the sketch by the use of two flanges, two elbows, and a length of  $\frac{1}{4}$ -inch pipe offset at D to clear the up and down, or vertical, slide. This should be made long enough so that the windshield can be slid back its full length. The rear flange should be fastened to the top of the awning frame and the front flange should be fastened to the side of the awning post. The vertical, or up and down runner or slide, is also  $\frac{1}{4}$ -inch pipe fastened at the top with a flange to the awning frame and at the bottom to the dash-board by means of a socket such as is used on detachable canopy tops for small open launches.



The upper guides at A-B on the windshield are made from  $\frac{1}{4}$ -inch pipe fittings as shown in the sketch, with the exception of the T, which is a  $\frac{3}{8}$ -inch fitting with a  $\frac{1}{4}$ -inch offset. This  $\frac{3}{8}$ -inch fitting will allow it to slide back and forth over the  $\frac{1}{4}$ -inch pipe runners. These fittings should be made up good and tight with the exception of the T which should rock or turn snugly on its thread. The guide at the bottom of the windshield is also made of a  $\frac{3}{8}$ -inch T with a  $\frac{1}{4}$ -inch offset fitted on the  $\frac{1}{4}$ -inch pipe on the bottom of the windshield.

J. C. H., New York City.



# Changing an Outboard Motor into an Inboard

Answers to the Following Question Published in the March Issue

"Illustrate and describe in detail how to alter an outboard motor into a successful inboard motor for installation in a light skiff"

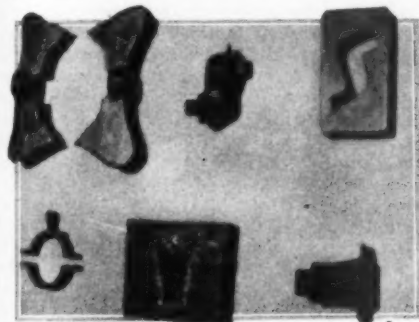
## Can Be Done at Negligible Expense

(Prize Winning Answer)

TO anyone at all familiar with motor construction the accompanying sketches and photographic illustrations will be practically all that is needed to carry out the work of altering an outboard motor into a successful inboard power plant.

From the patterns here pictured two sets of castings have already been made and two former outboard motors whose business ends had come in contact with hidden rocks and sunken stumps with dire results to the outboard parts, are now operating with absolute satisfaction as inboard motors.

The patterns were all home-made, amateur fashion from clear soft pine, an extremely sharp knife, some fine sandpaper, black shellac, and a little care being about all that was required in getting them out. The castings for the principal pieces are all made in brass and cost but \$3 for each set.



From the home-made patterns of C. E. B. castings were made, using parts of outboard motors which had been damaged by rocks. They are now undamaged inboards.



The cylinder, flywheel, and crankcase were all given a coat of flat black paint, rubbed lightly, varnished with two thin coats of spar varnish; the result was amazing.

run continually for lengthy periods. With all adjustments completed to satisfaction the motors were partially dismantled, the cylinder casting filed fairly smooth and the pores of the iron filled with iron filler. The cylinder was then given a coat of flat black paint rubbed lightly, varnished with two thin coats of spar varnish and rubbed down to a finish that resembled a new auto.

The crankcase and flywheel were also treated in a like manner excepting the rubbing which was omitted on these parts. The brass work was finally all smooth-file finished and polished with a fine emery cloth and latterly shined up

and worked into advantage. The most actual trying work consisted chiefly of carefully brazing the supporting lugs to the brass crankcase in the manner shown, and affixing the timer as indicated. The fitting of both manifolds and assembly of the pump was work of the simplest character while the flywheel was turned out from a cast-iron flange of suitable size.

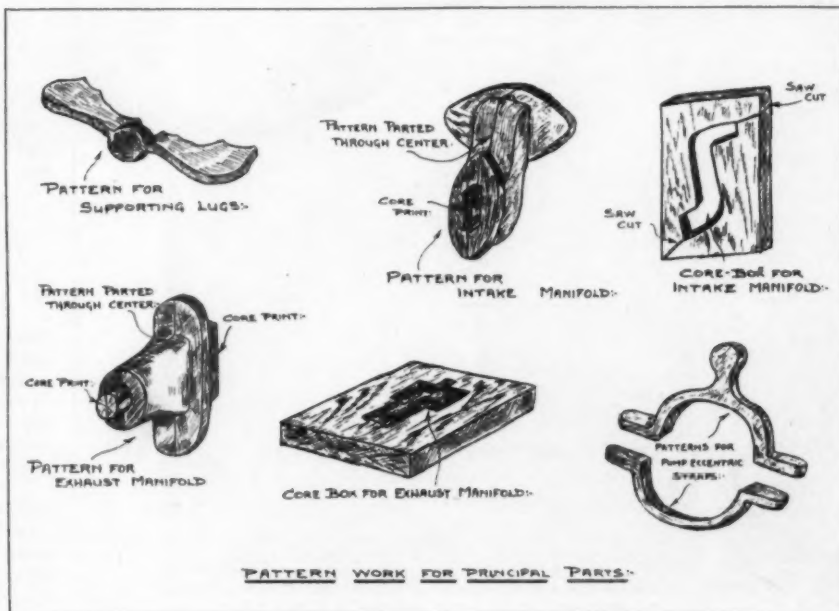
With the completion of the work a rigid bed was constructed in the cellar and the motors both with brass polish to an outstanding contrast with the black castings.

The motors are both creditable jobs, small, of course, but all that is to be desired for a small light skiff or tender for use on short runs. Should you like further detailed information regarding any part the writer will be pleased to forward same upon receiving inquiry addressed through the magazine.

C. E. B., Fall River, Mass.

The work on the castings, except for the filing up true of the different faces, consisted of simple boring and drilling operations. This work we were perhaps fortunate in obtaining gratis from an appreciative chap whom we had favored on several occasions last summer with a number of real successful fishing trips and who by the way we have since (during the last season) been able to start into building a little craft of the jingo-type all his own. The 1/4-inch ball check valves required for the pumps in each case cost sixty-eight cents at the local supply house and each spark plug with priming cup attached added another \$1.25 to the bill.

The remaining incidentals were for the most part picked up from the accumulations of the scrap box



The patterns were home-made from clear soft pine using an extremely sharp knife, some fine sandpaper, black shellac—and a little care

## Machine Work and Addition of Parts Necessary

**W**HEN considering the alteration of an outboard motor so as to adapt it to an inboard installation, it is well to think twice before starting the work. A certain amount of machine work will be necessary and some new parts must be added and, unless one is equipped to do this work himself, the change may prove more expensive than if an entire new motor and outfit were purchased.

It is rather difficult to give sketches and a detailed description of just what to do, inasmuch as the various makers have different methods of construction. In a general way, the following changes will be necessary. A new gasoline tank with piping is needed. The position of the mixing valve has to be changed so that it will be vertical when the motor is vertical. A new water pump is very often necessary and this must be mounted so as to operate from the end of the crankshaft. A new propeller shaft with coupling and an outboard stuffing box bearing are needed and with some motors it may even be necessary to get a new propeller. A thrust bearing is required on the shaft just back of the motor. Exhaust piping is needed as well as connections for the cooling water. Most likely the crankcase has no flanges or other means by which it can be bolted to a foundation so that provision must be made for this.

Remove the gasoline tank, the muffler and connections and the brackets that clamp the outfit to the boat. Next disconnect the propeller shaft housing where it is attached to the crankcase. In most cases, the housing and shaft can now be drawn from the end of the crankshaft, leaving the motor as a separate unit. The next thing is to make brackets out of half-inch iron bent in such a way that they can be securely fastened to the crankcase and, extending out from the sides at right angles to the vertical, serve as flanges to be bolted to a foundation. Their particular shape and method of fastening will depend on your make of motor.

If the spark control is not arranged so that the motor can be made to run in the opposite direction, it will be necessary to purchase a new propeller, the reason being that the propeller and crankshaft run in opposite directions in the outboard arrangement because of the bevel gears. A new shaft of the proper length with a coupling on one end to connect to the crankshaft and the other end fitted to take the propeller is necessary. An outboard stuffing box bearing for the shaft must also be bought. Get a thrust bearing and a collar to fit on end crankshaft to take up thrust from the propeller.

It is hardly feasible to try to use the old water pump as it is usually incorporated in the housing back of the propeller so that it is not easily adapted to another location. A

pump of the plunger type can be had that will work on an eccentric attached to the rear end of the crankshaft or you can get a rotary pump and drive it with gears. It should be fastened to brackets securely attached to the crankcase and then connected by tubing or a heavy piece of hose to the water inlet on the cylinder.

The thrust bearing can run between the end of the rear main bearing of the motor and a collar pinned to the shaft by a taper pin. This thrust bearing and collar must be carefully fitted as there should be very little if any end play, otherwise it will not fulfill its purpose of taking the propeller thrust.

The mixing valve will have to be turned at right angles to the old position so that it will be vertical. To accomplish this, it may be necessary to get a new flange connection, unless the old flange screws into the mixing valve, in which case it can be given a quarter turn.

A. L. M., New York City.

### Why Do It?

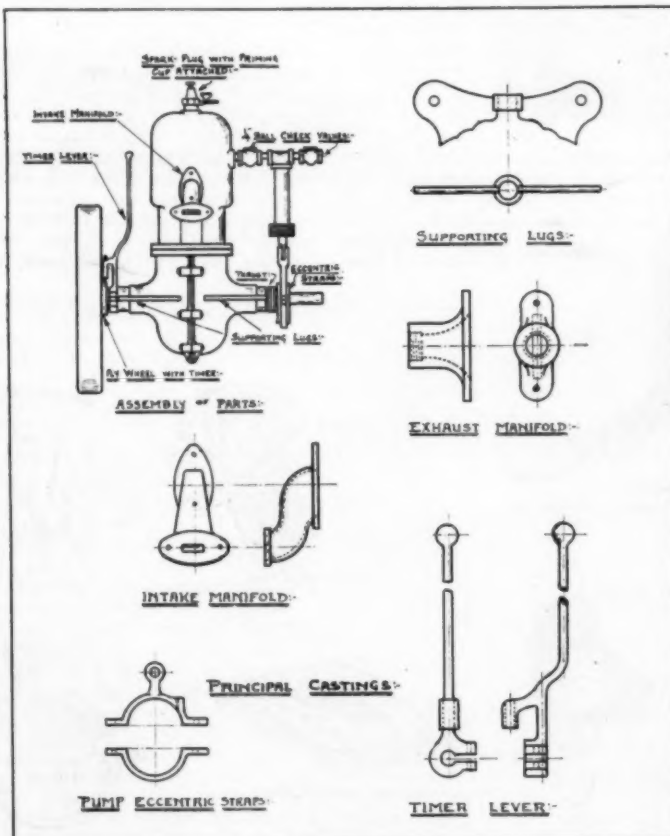
**T**HE value of the outboard motor for driving the tender has been repeatedly demonstrated, and for the tender of an average size cruiser all arguments are for it as against the small inboard motor. It is possible to convert an outboard motor to the inboard type but, why do it? Practically everything about the motor must be changed and a part of the equipment will need to be replaced by a different type part. A special motor foundation so constructed that the motor could be fastened down with the original clamps will be necessary, or brackets would have to be bolted to the crankcase in order to fasten the motor down in the usual manner and the alignment of a motor so bedded would be exceedingly hard to maintain. You could not expect any less vibration and a separate fuel tank would have to be provided.

The cylinders and the crankcase, including their bearings and interior parts of the motor are about all that could be used to advantage and of the accessories the ignition equipment alone is all that is usable without alterations. On most outboard motors the circulating pump is located in the water. This would have to be relocated or replaced and a special drive provided in order to use it on an inboard installation. The mixing valve or carburetor flange would have to be turned or a new flange provided in order to keep the carbureting device in a vertical position.

The oil holes in some outboard motors are in the proper position for a horizontal cylinder but will the crankpin get sufficient lubrication when the cylinder is set in a vertical position unless additional holes are drilled in the connecting rod?

For an inboard installation a shaftlog, stuffing box, and a rudder must be fitted to the boat besides the engine bed.

W. B. M.,  
Newburgh, N. Y.



According to A. L. M., a new gasoline tank with piping, a new water pump, a new propeller shaft with coupling, an outboard stuffing box bearing, a thrust bearing and possibly exhaust piping and connections for cooling water, as well as necessary

# Elise II, An 88-Foot Auxiliary Schooner



*Elise II is a three-masted auxiliary schooner designed by Bowes & Mower, of Philadelphia, and owned by Commodore Frank B. Bower, of Philadelphia. The view at the left shows the forward deck and standing rigging of Elsie II*



*The power plant of Elise II is one six-cylinder Standard motor, having a 6-inch bore and 8-inch stroke. Under power alone the boat has a speed of about 7 knots*



*Commodore Bower, owner of Elise II, at the wheel of his 88-foot schooner*

Photographs by Pearce



*One of the features of Elise II is the immense amount of room below decks and her spacious accommodations for the owner and his guests. The designers made good use of every bit of her 20 feet of beam*



# Two Men, a Maid and a Boat

Boojum Breasted Bounding Billows on the Bay or  
Sped Through Sea and Sound Submerged in Spray

By L. Maguire

## PART II

(Continued from April Issue)

AS we were dressing a little fish poked its head out of the water, gave dirty Bayard the O. O. and "Come on in, the water's fine," said he. Bayard hesitated. but Massachusetts Bay was calling and we needs must go.

It was a fine, clear day and after putting in gasoline we hastened out of the harbor, striking Massachusetts Bay at 6:30. Forgotten was the gloom, disgust, and weariness of the previous night. With the peaceful blue water of the bay stretching away before us, a brilliant sunlit sky above, cool refreshing breezes and we were again singing "Heigho for the Bounding Billow!"

The exhausted alcohol had not recuperated over night and in consequence it took almost two hours to cook the breakfast. Indeed, the cooking on this trip was no joke. The stove, a tiny one, had room for one pot only, and the cook when cooking must give it close attention to keep the pot from bouncing off. Our dishes, pots, food, etc., we kept in canvas-covered boxes. The cook invariably occupied one box, the stove another, and, of course, the things needed were always in one or the other of the boxes, so that there was a constant shift both of the stove and the cook.

Fortunately for this long drawn out breakfast the going was smooth, no wind at all and the water like glass. We shut down in the middle of the bay while we changed the batteries. I had a good opportunity to study the species porpoise for two great playful fellows cavorted within ten feet of the boat.

We struck a bad chop in Cape Cod Bay and it grew worse as we approached the mouth of the Canal. Near the entrance it was so bad that we had to throttle down the engine and creep in behind the breakwater.

Either the passage of a boat through the Canal was unusual or Boojum and crew were a rare sight, but at both bridges passing automobiles and pedestrians stopped in their tracks to gaze at us.

The sun was low in the sky when we left the Canal waters and ran out into Buzzards' Bay and thence into the peaceful, sheltered harbor at Onset. We found anchorage near a tiny island, dressed and went ashore to buy alcohol. Onset proved to be an attractive, if somewhat noisy summer resort, with a Coney Island look to it. Its main street was lined with popcorn and frankfurter stands, shooting galleries and post-card booths. Afar off we could

hear the squeaky strains of a merry-go-round organ; and the roar and rumble of the scenic railway.

On our way back to the boat we got lost and after wandering about on the dark water front for a half-hour we finally found our small boat Seive, made Boojum and went to bed. About midnight we were awakened by rain pouring into the cockpit, and there was a hasty scramble for oilskins and canvas to make up for the deficiencies of our all too short khaki top.

About 5:30 we rose, had a swim and breakfasted leisurely in the quiet little harbor. Later, Bayard built a steering platform. Hitherto I had had to stand up while steering, but two or three pieces of wood, a few nails, a little hammering, and we had a comfortable seat high enough to enable me to look well over the cabin top.

It was 9 o'clock before we got under way with a favoring tide but with the wind against us. We rolled and tumbled pretty badly as far as New Bedford, and I must confess that I was badly frightened by the plunging of the boat. Gritting my teeth, however, I kept her nose into the sea, expecting each wave we struck would swamp us. Buzzards' Bay is not particularly good sailing ground. Its shallow, ledge-strewn waters are seldom calm, and for long stretches its rocky floor may be plainly seen a few feet beneath the surface. Near New Bedford, however, deeper water made smoother going and our shattered nerves got thirty minutes respite before we struck open water and a heavy sea. Completely exhausted with the struggle to keep the boat from turning a summersault, we were ready to quit by the time we reached Sakonnet Light. Running in behind the breakwater that protects the mouth of the Sakonnet River, we got our lunch. While we were anchored here we saw a school of tiny fish. Out of the water they jumped, very close to the boat, hundreds of tiny silver flashes. We got our camera ready, and then, of course, they refused to perform.

On a nearby sloop several visitors sat around and stared us out of countenance, my pants, no doubt, the cause of their interest. Audible, detrimental remarks from Boojum having no effect, we levelled our binoculars upon them and they began to squirm under our steady gaze. Meanwhile, two fat men aboard the sloop struggled valiantly to get her under way. With much work and more talk they

(Continued on page 96)



A tiny boat on a vast sea and while the motor continues to behave you are monarch of all you survey

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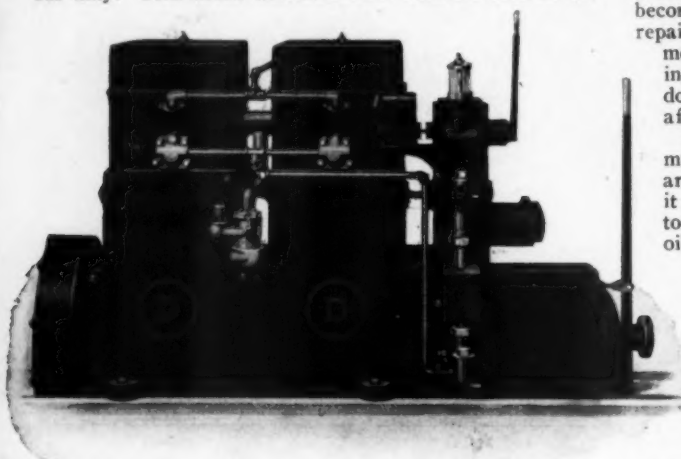


*Moonlight nights along the New England coast were made for fairy princes and princesses.  
The beauties of land, water and sky blend into the fairyland of dreams*

# AMERICAN MARINE MOTORS

## A New Line of Four-Cycle Motors

**T**HE Delaware marine motor manufactured by the Delaware Marine Motor Co., of 2 Commerce St., Wilmington, Del., has been designed for economical operation and maintenance; clean, silent and always ready for duty. This motor has been built with the idea of sav-



*Delaware marine motors are in three sizes—two-cylinder, 20 h.p.; four-cylinder, 40 h.p.; six-cylinder, 60 h.p. These are medium-duty motors with heavy-duty reliability built in. They are for runabouts, cruisers, and work boats. They are absolutely accessible in every part*

ing space in engine-rooms where usually much is lost and with that in view the motor is constructed so that practically every part is accessible from one side.

By removing only the cover plates, every moving part from crankshaft to water pump and air pump eccentrics becomes immediately accessible for inspection, adjustment, repair or replacement. When the crankcase cover is removed the connecting rods can be uncoupled by loosening two bolts for each rod. Any piston can be dropped down and withdrawn without the slightest difficulty, after the connecting rod is uncoupled.

There is not a single exposed part on the Delaware marine motor. They are not merely covered up, they are enclosed in a case that keeps oil and fumes in while it keeps dirt and grit out. The completely enclosed motor insures clean and easy lubrication, because neither oil holes nor grease cups are used at any point. The cylinders are cast in pairs, have ample jacket space and serve as support for the camshaft. The cylinder heads are removable. They have water space completely surrounding all valve passages where hot gas comes in contact with the iron. Pistons are made of the finest gray iron. McQuay-Norris leak-proof piston rings are used. Connecting rods are of high tensile manganese bronze, as strong as steel. The crankshaft is of forged carbon steel accurately and smoothly machined. The flywheel is fastened on with a taper and key. Timing gears are very heavy and rugged; steel to bronze. They are accurately cut, silent and long-wearing. The Carlyle-Johnson reverse gear is built into this motor. Its installation inside of the crankcase assures continuous lubrication at all times without impairing its accessibility.

## A Motor for Commercial Craft

**O**UT on the Pacific coast where the motor-driven commercial boat has come into its own and where the commercial fleet has been developed to a state of perfection found in hardly any other locality the gasoline and distillate engine has made an enviable record. It is here that the efficiency and reliability of marine motors is quickly appreciated.

Under these conditions it is only natural that the medium- and heavy-duty motors are universally used. The light, high-speed motor has not stood the test of actual service. One of the best known and widely used motors on the coast is the Acme, built by the Acme Engine Co., of San Francisco, Cal. These are real heavy-duty motors ranging from 8 h.p. for the single-cylinder up to the 125 h.p. six-cylinder machine. They are all of the heavy, slow-speed type, developing their rated power at from 300 to 400 r.p.m.

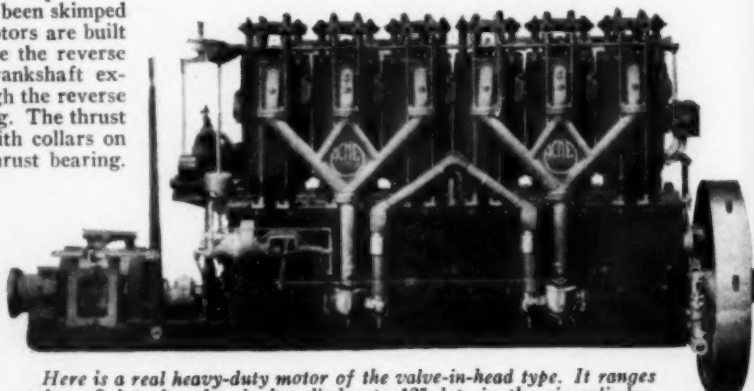
Like all heavy-duty motors, material has not been skimmed at the expense of serviceability. All Acme motors are built with the bed plate or base extended to include the reverse gear. Another special feature is that the crankshaft extends from the flywheel all the way back through the reverse gear and into the tail shaft in the thrust bearing. The thrust bearing is of the marine steam engine type with collars on the tail shaft which run in grooves in the thrust bearing.

The bed plate, frame or upper crankcase, cylinders, and cylinder heads are all cast separately of close-grained gray iron. The crankshafts and connecting rods are forged from solid steel billets of high tensile strength. Each billet is tested by Lloyd's Agents according to the rules of Lloyd's Register for marine shafting. Both the upper and lower bearings of the connecting rods are adjustable. The upper bearing is of phosphor bronze while the lower bearing is as well as the main crankshaft bearings are

of a special plastic bronze, easily removed and interchangeable. No babbitt is used.

These motors are of the valve-in-head type, with extra large valves with wide seats. The valve guides are a separate casting fitted into the cylinder head and easily removable. The water enters the cylinder heads from the cylinders by means of outside by-passes, thus allowing the use of a copper cylinder head gasket that will not leak.

All Acme engines are fitted with Schebler carbureters, the air intake being piped to a hot air sleeve on the exhaust manifold, thus providing for operation on kerosene or distillate as well as gasoline. Either make-and-break or jump spark ignition can be supplied. In either case a gear-driven magneto is used.



*Here is a real heavy-duty motor of the valve-in-head type. It ranges from 8 h.p. for the single-cylinder to 125 h.p. in the six-cylinder. They develop their rated power at from 300 to 400 r.p.m.*



# Safety Suits That Really Save At Sea

Preservers Perfected Under Pressure of Prussian Peril—Garments Devised to Afford Protection from Exposure As Well As to Keep One Afloat

By Harwood Koppel

**H**AD it not been for the urgent demand created by the war for a life preserver that would really do what its name implies it is extremely doubtful if the evolution of the life saving devices and suits which have in the last year or two been perfected, would have come into actual use in any number for many years yet. The public, always loath to accept a new invention or even an innovation on an accepted device of any sort, until it has been shown, was given such demonstrations that there was little left to ask for by the men from Missouri.

With hundreds of thousands of our best boys being sent overseas on transports menaced day and night by the lurking U-boats and with other thousands sailing the seas on the ships of the Navy, the Government was placed in the position of safe guarding their lives in reality and not in theory. For the thousands of years that men had been navigating the waterways of the world there had always been some attempt at having on board vessels life saving appliances of some sort for an emergency, but the best thought of the men most capable of devising efficient means of life saving devices had not been given to the subject and so for years and years men had been going out to sea with nothing better for their protection than the cork device, by courtesy called a life preserver. It is true that under certain circumstances the cork devices would keep a man afloat on the surface of the water, but there were other times when they kept him afloat, it was true, but with his head down and his feet in the air. This, then, was not always a life preserver, but in reality it would better have been termed a body saver. Again, unless cork devices were constantly looked after they rapidly deteriorated and crumbled into bits while the cloth in which the cork was confined rotted away.

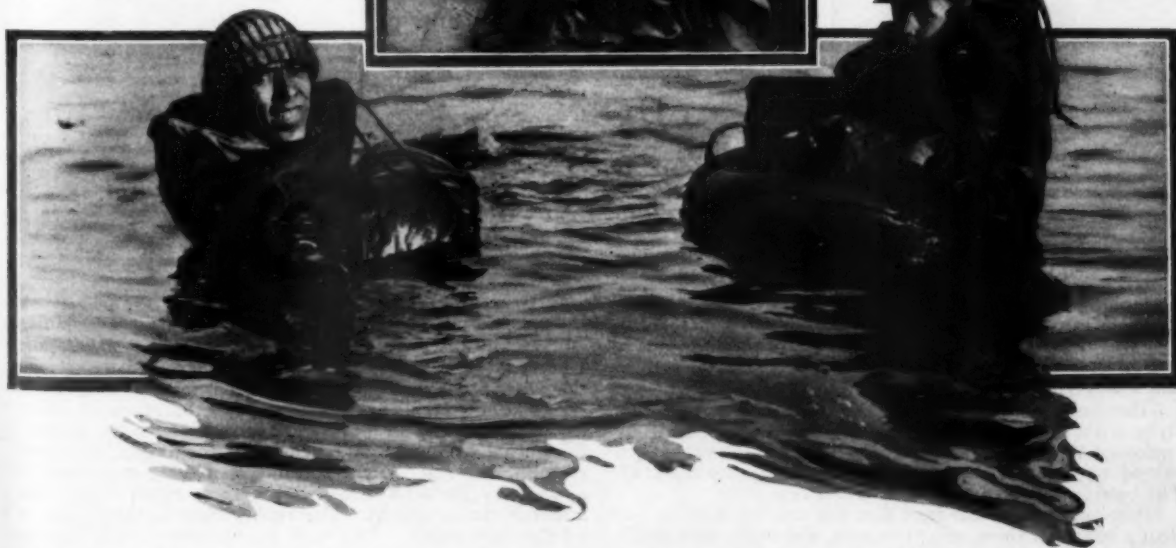
Hence, with the incentive of the many lives being lost through the torpedoing of vessels by the German submersibles it became imperative that a device of some sort be constructed that would actually save lives at sea. One of the

strongest objections to the cork jackets was that even in the instances where they did sustain a person on the surface they afforded no protection from exposure. It offered little consolation to a man to know that when his ship sank he would be supported on the crest of the waves, if his vessel was going to sink in the North Sea in the dead of winter, where exposure to the cold water and the icy winds meant death in a few hours or perhaps a few minutes—after intense suffering.

With this idea in view practical men began working on a suit that would not only sustain a man on the waters but preserve him from exposure as well. That they eventually succeeded in devising such a suit is best attested by the official Government reports and recommendations on the subject. One of the strange coincidences was that several suits combining almost identical features, but differing somewhat in structure and composition, appeared almost simultaneously. All were so good that it is not for a layman like the writer to attempt to pick the best, and so this article shall be confined simply to a description of the various suits devised, as described by the men who invented and manufactured them.

In all of them Kapok is the ingredient that gives the element of buoyancy to these suits. For that reason there is no danger if the suit is punctured, because Kapok will not readily absorb water. Since the suit does not depend upon air for its buoyancy, it will float no matter how many punctures it may receive. This Kapok is a water-proof vegetable fibre, which comes from Java and the Straits Settlements, and is five times more buoyant than cork. It will keep the wearer afloat indefinitely, entirely independent of the rubberized garment, and if the latter were torn to shreds, leaving only the Kapok padding, the wearer would still have a life preserver that is more efficient than

Photograph by  
Central News  
Photo Service



The various safety suits are without complex features—easily and expeditiously donned and one may float around on the water with one's head free almost comfortably

any device I know of which depends solely upon the air.

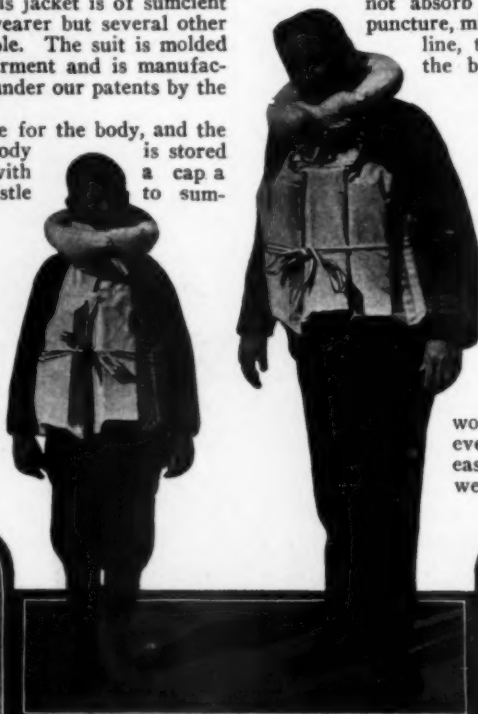
#### THE DREADNAUGHT SAFETY SUIT

"THIS garment," said its inventor, "is impregnable to both water and the atmosphere. It is non-metallic, with a simple effective closure with no frames, draw strings or mechanical contrivances. It is made of flexible rubberized material of the best quality. The collar and wrist-lets are of elastic rubber, adjustable to any size neck and wrist. The soles are of pliable high-gravity rubber, and the snaps and buckles are of rust-proof metal.

"Its buoyancy is indestructible. The garment is fitted with a detachable padded lining of silky fibre kapok, of the same sort that the Government uses in its life preservers. The lining can be used separately, as it is in the form of a jacket with buttons inside of the suit. This jacket is of sufficient buoyancy to support not only the wearer but several other persons as well. A leak is impossible. The suit is molded and vulcanized into a one-piece garment and is manufactured exclusively for our company under our patents by the United States Rubber Company.

"The suit acts as a thermos bottle for the body, and the natural heat radiating from the body up and retained. It is equipped with pocket for carrying food and a whistle for assistance or designate the wearer's location in the water in darkness or fog. There are also extra rubber mittens to protect the hands. It requires less than a minute to adjust completely and may be put on over the regular clothing. There is no delay or confusion. When not being worn it makes a small bundle that can be conveniently carried, the complete outfit weighing fourteen pounds and measuring 18 x 12 x 7 inches. It requires much less space

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moment, close the suit by means of two clamps attached in a convenient position in front, snap the safety lock and plunge into the water, where he or she will float in an upright position, head and shoulders well above the water. A lead sole in the bottom of each shoe of the suit keeps the wearer in this upright position, even if exhausted or unconscious.

"The suit does not depend for buoyancy upon the air that may be confined within it. The upper portion of the garment is lined with a special composition of kapok, which has five times the buoyancy of cork and which also adds to the warmth.

"The suit is made of very strong material, not easily punctured; but punctured or damaged, it will retain its buoyancy, because the special composition will not absorb water. While water, in case of puncture, might fill the suit as high as the water-line, tests have proven that the heat of the body will take the chill from the water in the suit and largely protect the wearer from exposure, while, at the same time, the buoyant padding will prevent all possibility of drowning.

"There is a water-proof pocket conveniently placed in front, large enough to carry a canteen with fresh water or liquid food sufficient to last forty-eight hours. A whistle is at hand to help attract the attention of relief boats and rescuers, or to signal one's location to others in darkness and fog.

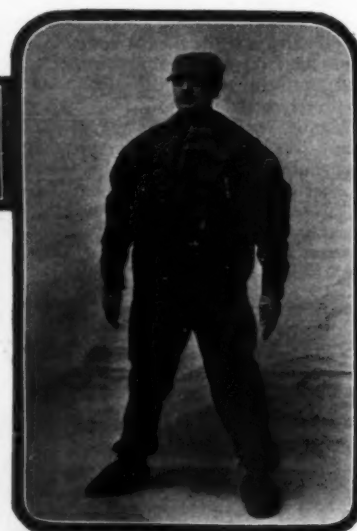
"The Ever-Warm safety suit is made in different sizes and can be worn by man or woman. The fit, however, is not essential, as the suit is easily adjustable; a small person can wear a large one if necessary. It



The combined kapok and balsa jacket above and the kapok suits on the right and left are all designed with the idea of giving their wearers freedom of movement while insuring the maximum of safety. Women wear them as comfortably as men. They are of negligible weight and in the water sustain one indefinitely

than is taken up by the ordinary cork life preserver. It comes in all sizes for men, women and children, large, lean, tall or slim."

is light in weight, easy to carry, and is packed in a suitcase or canvas bag. With ordinary care it will last many years."



#### THE EVER-WARM SAFETY SUIT

HERE is the inventor's own description of the Ever-Warm safety suit, which was designed by him to save and protect its wearer in water anywhere, at any time, under any conditions:

"The Ever-Warm safety suit," he said, "is made in union style, with shoes and mittens all in one piece, completely enclosing the body, excepting the head, in a water-tight suit of a special quality of absolutely water-proof material. The head is protected by a water-proof cap.

"It is so simply constructed that you can slip it on in less than a minute without any assistance, and many have put it on within fifteen seconds. You do not remove your shoes or any of your clothing. Any man, woman or child can step into the suit clothed just as he or she may be at the

#### UNIVERSAL LIFE SAVING SUIT

"THIS suit," said its inventor, "is made of double texture with rubberizing between the fabrics, the Universal Life Saving Suit thus is constructed to prevent the water-proofing from wear and from readily being punctured. The sections are first sewed together, then all seams are cemented and strapped and are reinforced at all points of unusual strain or wear, such as ends of fingers, heels and crotch. The suit is next vulcanized, making it practically a seamless garment that will not come apart under any atmospheric conditions. The rubber used in these suits is of the best grade. The feet are weighted with flexible metallic soles weighing two pounds each. The total weight of the large size suit is seventeen pounds and the medium size fifteen pounds.

(Continued on page 74)

# My Ideal Auxiliary

## No. 4, Drift—A 20-Foot Sloop

By W. D. Reinhard

A BOAT of light draft, large enough to carry a party of eight or ten and to accommodate two or three over a week-end, were the principal requirements in mind when the plans for Drift were drawn. It was also desired to design the boat to permit grounding at low tide occasionally, where she would be exposed to breakers.

In order to do this the hull must rest on a fairly even keel when aground, otherwise the sea is likely to swamp her as the tide rises.

Other requirements were to make use of the Long Island breezes—hence she's a sail boat; incidentally equipped with power, graceful in appearance, speedy under either sail or power and finally, inexpensive.

The size chosen is a 20-foot sloop having a low cabin, affording four feet three inches headroom. The size of the cabin is small indeed but large enough to bunk two and possibly a third, comfortably for several nights.

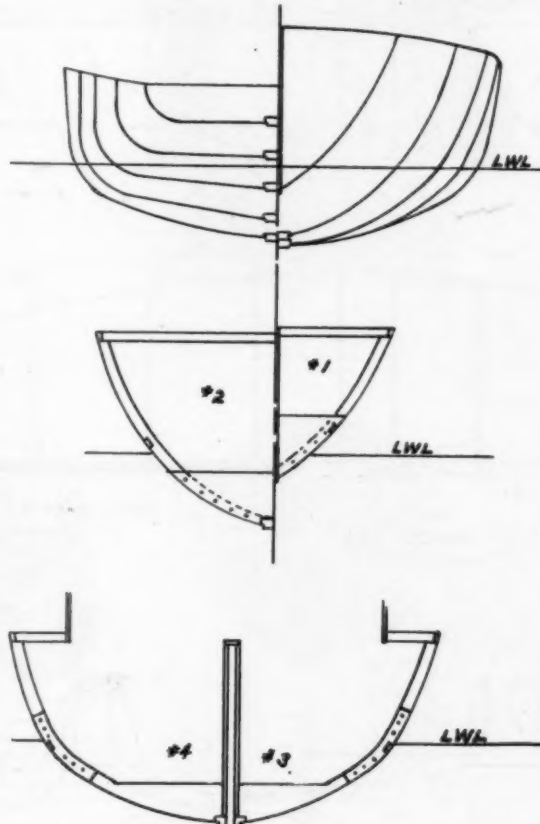
The centerboard, to be weighted, extends to within 15 inches of the back of the cabin, the object being to permit the gangway in a central position, which is necessary as it permits accessibility to starting the engine. The bulkhead at section six is solid, minimizing the odors from the engine which usually occupy a small cabin. The power plant is a Gray Model U, 3-h.p. motor, swinging a twelve-inch wheel. This engine was chosen because of its compact form and fuel consumption, also because 3 h.p. is plenty for a boat of this type. A speed of eight or so miles might be expected as the engine will turn at 900 r.p.m., turning a three-bladed wheel 12 x 16 inches.

The fuel tank is to be of twenty-five gallons capacity and located under the rear cockpit seat, thereby keeping the gas away from the cabin.

The "My Ideal Auxiliary" Competition is open to every amateur of the country. There are no other restrictions and no limit to the size or type of the auxiliary which the designer may choose as his "Ideal". Designs may be submitted any time up to June 1, 1919, but the earlier they are received, the better chance the designer has to have them published. The plans should be complete and include outboard profile, arrangement plans, sections, construction, details, lines, and a table of offsets. A description of not over 2,500 words should accompany the plans. For each design published we will pay \$35 and to the winner of the series will be presented \$65 worth of boat merchandise of the winner's choosing. McTeR BoatnG's subscribers pick the winner.

SCALE  $\frac{1}{2}" = 1' "$

TABLE OF OFFSETS											
IN FEET INCHES EIGHTHS											
STATION	STEM	1	2	3	4	5	6	8	9	10	T.
TOP OF SHEAR	400	3100	384	370	354	340	334	320	310	304	300
TOP OF CHINE		294	184	163	156	160	164	190	200	234	274
BOTTOM OF KEEL		010	020	000	000	000	007	060	104	174	230
SHEAR		230	336	3102	400	400	311	373	333	210	260
CHINE		130	250	307	354	370	381	361	330	2107	256
KEEL		010	020	030	030	030	030	030	030	030	030



Sections Nos. 1, 2, 3 and 4 and lines of Drift; Scale: 5/16 inch equals one foot

The cockpit is to be self-bailing, for reasons best known to anyone who ever had anything to do with small boats, the floor to be above the top of the cylinder head and provided with a flush hinged hatch. Either a wheel or tiller handle may be used to steer by, but a handle calls for a less expensive, simpler and more practical outfit for a boat of this type.

Don't misunderstand me by concluding a party of eight or ten is to be entertained in the cockpit—nothing doing, we're out for air.

How many boat owners have ever taken out a few friends when at least half of them didn't stroll forward and camp out on the cabin roof? For the convenience of these few, including myself, the deck is made a foot in width, providing a foothold at the expense of room within.

The materials entering her construction are oak and pine. The keel is to be of oak, one piece, 2 x 6 inches, extending from the transom to the junction with the stem. The stem, also of oak, to be 2 x 4 and properly babbitted. The ribs space on 2-foot centers, with the exception of those in the vicinity of the engine, are to be of 1 x 2-inch oak as shown in plans. Where space is not desired and the rib is out of the way, such as number 8, the inner edge is straight, to save time and unnecessary work in her construction and as weight is needed for ballast, her size is immaterial.

The planking is to be of white pine, 1 1/2 x 2 inches, fastened every foot with wire nails 3 inches long. Fastening in this manner, makes an extremely rigid construction for thin hulls. The usual method of fastening will, of course, be used, employing galvanized fastenings. The decking and cabin roof are to be of 3/4 x 3-inch pine. The coaming, forming the cabin sides is to be of oak 3/4 x 15 inches, if that width is obtainable. All



flooring bulkheads, lockers, berths, and center-board are to be of white pine.

You will notice the rather full lines of the bilge which keep the hull on an even keel when aground. The displacement of the bilge is not great enough to sink the hull to the waterline, therefore necessitating the addition of weight in form of ballast which is needed, as anyone can see by glancing at the sail area. This additional weight, which is to be determined when the hull is launched, can be carried under the flooring near the keel, the entire length of the keel; preferable of cement.

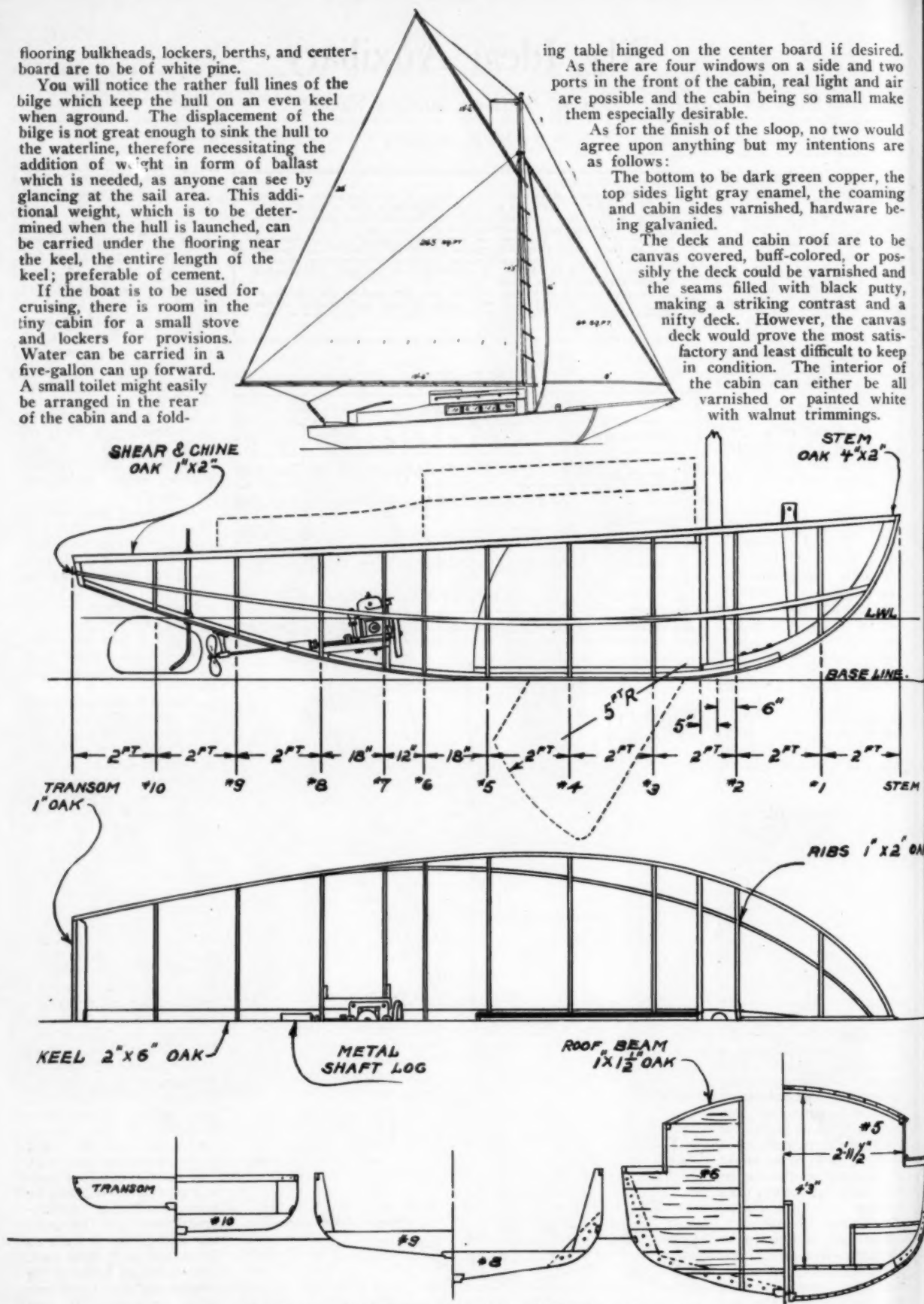
If the boat is to be used for cruising, there is room in the tiny cabin for a small stove and lockers for provisions. Water can be carried in a five-gallon can up forward. A small toilet might easily be arranged in the rear of the cabin and a fold-

ing table hinged on the center board if desired. As there are four windows on a side and two ports in the front of the cabin, real light and air are possible and the cabin being so small make them especially desirable.

As for the finish of the sloop, no two would agree upon anything but my intentions are as follows:

The bottom to be dark green copper, the top sides light gray enamel, the coaming and cabin sides varnished, hardware being galvanized.

The deck and cabin roof are to be canvas covered, buff-colored, or possibly the deck could be varnished and the seams filled with black putty, making a striking contrast and a nifty deck. However, the canvas deck would prove the most satisfactory and least difficult to keep in condition. The interior of the cabin can either be all varnished or painted white with walnut trimmings.



Detail plans of the 20-foot sloop; Scale: 5/16 inch equals one foot

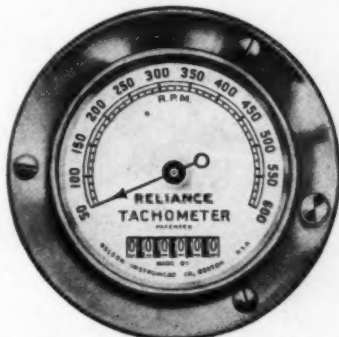
# New Things for Motor Boatmen

Each month new parts, attachments, and fittings, interesting and invaluable to owners of large and small motor boats, are added to the devices already on the market. Announcements of these articles come to us in such numbers that in order to introduce all of them to our readers we have been obliged to omit descrip-

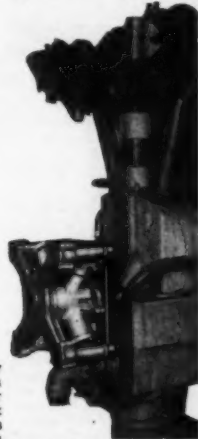
tions and publish only illustrations with short explanatory captions. In doing this, however, we urgently invite our readers to write us for complete information, as we shall take the greatest pleasure in providing it, together with the name and address of the manufacturers from whom the products may be obtained.



A renewable fuse that offers several distinguishing features. The gray, hard fibre shell is of unusual thickness: brass end caps and washers are particularly heavy. An ingenious ventilating patch is provided for the escape of gases generated during the operation



This tachometer has a checking counter by means of which, at any time, the accuracy of the pointer may be verified. It does not run continuously; it is operated by a button at each side of the case. It is invaluable when navigating in a fog



The noteworthy feature of this compressed air starter is that it replenishes its energy in less time than any other starting system in existence, its manufacturers say. It recharges itself in thirty seconds. No alteration in motor or other gear reductions is needed for attachments

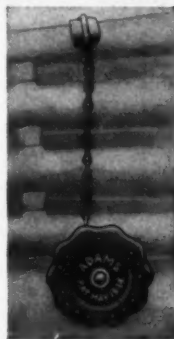


Convenient to use, with outside wind and set, this clock may also be regulated from the front. It has an eight-day movement

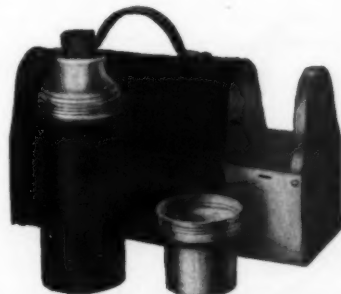


Heat generated by electric current has solved the problem of boatmen warm in the coldest weather. This suit has a rubberized moleskin coat lined with lamb, an electrically heated helmet-lining of silk jersey and similar linings for moccasins and gloves. The suit is not heated as it is only necessary to protect the extremities

ated by an has solved the keeping motor in open boats



A motor boat top holder that is both neat and efficient. The chain is of steel, sherardized and enameled. Its strength is three times more than that of a strap holder



A boating luncheon with a steaming hot cup of coffee, or an ice cold glass of milk can be enjoyed with this lunch box. It is of heavy tin, of firm and durable construction and built to stand long and severe usage



To know positively at all times that the engine of your motor boat is functioning properly, is performing smoothly and accurately. Constructed on the centrifugal plan of physics this tachometer is absolutely accurate



For small ship's galleys this stove is ideal. A hot blast tube passes through the smoke flue thereby heating the draft air before it strikes the fire, producing perfect combustion. The firebox is made wide and deep for wood

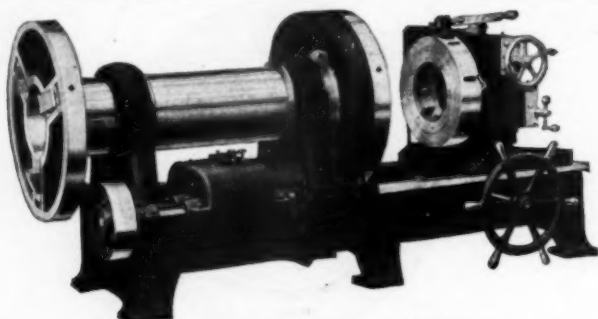
Do not fail to write to the editor if you desire information concerning any of the above new things

# Efficiency Devices

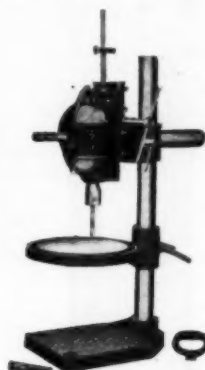
From time to time manufacturers put on the market improved devices which are designed to increase the efficiency of individuals and plants in doing certain work. Among these are generally a number valuable to boat owners and boat builders, in repair and construction work. In order that those who desire to use them may know just what they are like illustrations are published, while a short description is given in order to explain just what they are for.



The advantage of this hammer handle screw-driver is that it answers every purpose of an ordinary screw-driver, plus the uses of a hammer. When not used as a hammer the upper part of the blade snaps into the handle, making it vertical like other screw-drivers.



This pipe threading and cutting machine comes in several sizes, each size covering a range of eight or ten sizes of pipe. Dies can be furnished for threading pipe, casing or bolts.



Used both as a portable hand drill and a bench drill this is a handy tool. Height over all 37 inches. Weight 150 pounds. It can be taken out of the frame for use as a portable hand drill.



This ratchet will offset trained skill. The clear through the head makes it possible to run a nut down on a long bolt. Wrench heads are interchangeable in each handle to fit nuts.

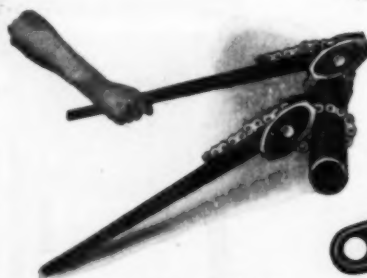
versible wrench trained opening



For removing rust and paint from the hulls of boats; for scaling boilers, grinding, buffing, polishing, drilling, reaming, etc., this rotary scraper machine does the work of ten to fifteen men working with chipping hammers, or about twice the work of a compressed air chisel or hammer. Can be connected to nearest lamp socket. They have Westinghouse motors.



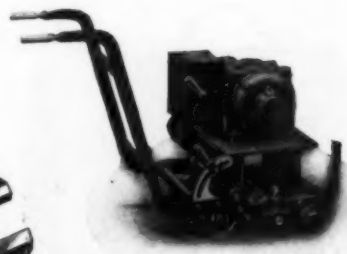
A labor saving bit, unlike other bits, is guided by its circular rim instead of its center. Consequently it will bore any arc of a circle and can be guided regardless of grain or knots, leaving a true polished surface.



Tight corners won't bother you with this chain pipe wrench. It is two wrenches in one. The first, wide and powerful for standard pipe work—the second, with outer jaws removed, for narrow or irregular work and it is reversible.



An adjustable S wrench with a handle of malleable iron and a jaw of forged steel. It can be used in corners or in contracted spaces inaccessible to the monkey wrench.



This portable electric deck planing machine is furnished complete with motor ready to operate. The depth of cut is adjustable and knives lift clear of deck on return movement.

Do not fail to write to the editor if you desire information concerning any of the above efficiency devices



# How the Diesel Engine Proves In

(Continued from April Issue)

## PART V

By Herbert Haas

**I**N some pumps the push-rod has a constant stroke, but the starting point of its travel is influenced by the governor, and it subjects the lift of the suction valve to the same variation in travel. Pumps of this type are usually provided with a hand crank, which permits the lifting of the suction valve to its extreme position and the lifting of the discharge valve sufficiently off its seat to let the oil flow by gravity into the pump chamber and the fuel-valve oil-delivery pipe from the oil-storage tank (which is higher than the engine) by opening a cock connecting the pump chamber with the atmosphere. When the suction valve is held wide open the engine is stopped. These pumps have been developed to a high degree of perfection, and notwithstanding the severe conditions under which they have to operate they are highly reliable.

Pumps may be vertical or horizontal; the former are used if operated from the camshaft; although pumps with a variable stroke of the plunger are usually of the horizontal type. Pumps driven from the vertical governor shaft of the vertical engines are usually horizontal.

### NUMBER OF PUMPS REQUIRED

Practice regarding the number of fuel pumps supplied with multi-cylinder engines differs, being often decided by a desire to reduce manufacturing costs.

When only one pump is supplied the fuel has to be divided and proportioned equally to the different cylinders. This is done with small steel diaphragms, the size of the holes being determined experimentally, allowance having to be made for the resistance in the different pipe branches leading to each fuel valve. This method is not entirely satisfactory, especially where a high degree of regulation is desired, as in synchronizing. With a decrease in load, some of the cylinders will receive an excess of fuel, the supply being proportioned to the load before the governor acted. If one or more of the branches is obstructed the active cylinder will be overloaded, and if any of the fuel valves or the fuel passages to them leak the active cylinders will be underloaded.

In pumps that are driven by the vertical governor shaft, which in an engine having a four-stroke cycle makes double the number of revolutions of the camshaft, the plunger delivers the fuel in two parts for any one fuel charge, corresponding to one revolution of the camshaft. The governor, by acting between the two plunger strokes, can therefore adjust the second part of the fuel charge to the new engine load, counteracting somewhat the defect mentioned. As a result of the desire to improve the regulation further, individual pumps are often built as multi-plunger pumps, one plunger being provided for each fuel valve (each cylinder). As the plungers are driven simultaneously by one eccentric device they divide the fuel effectively, but the governor continues to influence only the combined quantity of fuel delivered by all the plungers and not of that delivered by each plunger successively.

To avoid these defects many builders provide an independent pump for each cylinder, each pump being separately under the influence of the governor. The cams or eccentrics actuating these pumps are mounted on the camshaft (or the governor shaft) with different leading angles, corresponding to the sequence at which the different fuel valves act, and each pump delivers the oil just before the fuel valve it serves opens. Engines so equipped have the most effective regulation.

### AIR COMPRESSORS AND RECEIVERS

The air required for starting the engine and for atomizing and injecting the fuel is furnished by an air compressor. On account of the high pressure necessary, the air is compressed in two or three stages. Ample cooling of the compressor cylinders and of the air in intercoolers between stages is not merely desirable to approach isothermal compression and reduce the power needed for compression, but is necessary to avoid accidents that may wreck the com-

pressor, with possible injury to the operators. With insufficient cooling of air and excessive use of cylinder-lubricating oil or of an unstable oil, the oil vapor may form an explosive mixture with the heated air and be ignited upon compression. Three-stage compression is therefore much to be preferred, as it permits compressing the air more gradually, and the lower compression ratios avoid excessive terminal temperatures; it also permits cooling the air more thoroughly in intercoolers before it is passed from one stage to the succeeding stage.

The air leaving the last stage of the compressor should be passed through an aftercooler and an oil separator before it is stored in the air receivers. This step is taken not so much to prevent a drop in pressure in the injection air bottle, with the contraction of the heated air on cooling, as to avoid explosions of the heated air charged with oil vapor. Regrettable accidents have happened from failure to provide intercoolers and aftercoolers. Not only pipes, but air receivers as well, have burst. Flame passing through the air pipe and into the air receiver charged with oil vapor has ignited this vapor and blown up the receiver. The aftercooler cools the air, and the oil-and-water vapors are condensed in the separator and from time to time are drained.

The air compressor should be lubricated thoroughly, but without the use of an excessive quantity of oil. The oil used should have a paraffin base, should be of great stability at high temperature, and should have high flash and burning points.

The air compressor is usually driven direct from the main shaft of the engine. On multi-cylinder engines with closed crankcase the compressor usually has the appearance of an additional cylinder, the compressor cylinders and pipe-coil air coolers being surrounded with a mantle forming a water space.

On some engines, especially large units, more than one compressor is used to avoid the large size necessary with only a single compressor. Moreover, greater accessibility and reliability are obtained, and the work of compression is divided into a larger number of smaller absolute impulses.

Compressors may be vertical, horizontal, or inclined for both vertical and horizontal engines. They are made of cast iron, with water-jacketed cylinders, or are surrounded by a mantle which forms a large water space and in which are housed the air-cooling coils. More systematic cooling can be done by using water-jacketed cylinders and independent intercoolers. Also, these then become more accessible. The cylinders are stepped down to correspond with the number of stages; likewise the pistons, which are of cast iron. The high-pressure end is usually too small in diameter to permit extending the snap rings sufficiently to slip them over the piston. They are then held between spacing rings and locked with a nut in the end of the piston.

The valves are metal poppet or disc valves. The discharge and intake valves between stages are preferably housed together in one cage, of a construction that facilitates their removal and replacement. The high pressure demands small clearance spaces; the interior of the cylinder-head end should therefore be free of pockets or dead spaces, and the valve-seats should conform closely to the inner surface of the cylinder; the piston likewise should conform to the shape of the cylinder head to permit its close approach to the head. Each intercooler should be fitted with an oil separator, so that excess lubricating oil and condensed water can be separated and drained and not allowed to pass on to the next stage.

A blow-off (safety) valve should be placed in the high-pressure air pipe leading to the air receiver, directly back of the high-pressure end of the compressor (past its discharge valve), to prevent the bursting of the pipe as the result of an obstruction. The necessity of an aftercooler and an oil separator has already been mentioned.

Compressor troubles are probably responsible for a large proportion of shutdowns in the operation of the Diesel engine. Particular care should be used in compressor construction to make all parts as simple as possible and still retain the maximum efficiency and reliability. Valves should be readily interchangeable, and the material and workmanship of the highest order.

The air for the compressor is usually stored in three air receivers, two large ones for the air used in starting the engine and a smaller one for the injection of air. These receivers are made of seamless drawn steel, and to avoid heavy walls and excessive weight are relatively long and of small diameter ( $L/D = 4$  to  $8$ ). They are interconnected with a system of pipes controlled by valves, so that either of the large bottles can be replenished with air from the injection-air bottle, which is supplied from the air compressor. The valve bodies are machined out of solid forged-steel blocks. The valve bodies are connected to the air pipes by copper cones and steel gland nuts. The valves are controlled by large 8-inch hand wheels.

One of the large air bottles is used for storing a reserve supply of air under a pressure of 1,000 pounds per square inch. Air is drawn from the other when the engine is started. The latter bottle is refilled as soon as the engine is in operation. The air compressor is designed amply to replenish in fifteen to twenty minutes' running the air so used without drawing on that used for injecting the fuel with the engine at full load. Manometers are provided to indicate the pressure in the large bottles and the injection-air bottle and the intermediate pressure of the compressor. At least one of the large air receivers is filled with air at the manufacturer's works and shipped with the engine to be used in starting it for the first time. Before the engine is started at any time the operator should convince himself that every part of it is in operating condition; should he fail to start it by turning on the starting air he should close the air valve at once and locate the cause of failure rather than make a number of attempts and waste the compressed air.

If all the air has been used before the operator has succeeded in starting the engine which operates the compressor for producing a fresh supply, compressed carbon dioxide (carbonic-acid gas) can be used in lieu of compressed air. To prevent the freezing of the gas when it is drawn, the top part of the container may be warmed by wrapping cloths soaked in hot water around it. The container should not be heated by such means as torches, as there is great danger of bursting it from overheating the gas.

The size and the number of air receivers vary with the size of the installation. In power plants using a number of engines it is well to interconnect the air receivers of the different engines, so that any one can be drawn upon in emergencies for any of the engines. Small engines need a relatively greater air-storage capacity per horsepower than do large engines. The capacity required varies from fifteen to twenty gallons per 100 h.p. for the injection-air bottle and from 60 to 200 gallons per 100 h.p. for the starting-air receivers.

#### REGULATION OF AIR SUPPLY

The air supply to the fuel valves is regulated by throttling the discharge valve on the injection-air bottle, and the desired pressure, indicated by a manometer on the injection-air bottle, is maintained by correspondingly throttling the air going to the air compressor at the air intake.

Each bottle is provided with a cock and a drain-pipe reaching to the bottom of the bottle to drain it of accumulated condensed water and oil.

For starting some engines, low-pressure air is used (100 to 250 pounds per square inch), which is stored in the standard type of sheet-steel, riveted air receivers. The receivers are filled with air drawn from the injection-air bottle and supplied by the air compressor. In other engines the air receivers are eliminated altogether and a seamless steel pipe is used between the compressor and the fuel valves, the pipe taking the place of the injection-air bottle. A separate small compressor, driven by a gasoline engine, supplies the starting air. This practice lowers the first cost of the engine, but the absence of any air reserve makes it necessary that the compressor furnishing the injection air be of unfailing reliability. With the opening and closing of the fuel valves and the lack of sufficient receiver capacity the pressure fluctuates, and with an obstruction in the pipe the pressure may rise abruptly and burst the pipe, as even the precautionary

blow-off valves cannot be depended upon to act unfailingly. The presence of a gasoline engine with its highly inflammable fuel introduces a fire risk that is absent in installations that derive the starting air from the engine-driven compressor and have in the engine-room only a small supply of fuel oil with a high flash point. This advantage of the Diesel engine should not be appraised too lightly in many industrial plants, such as textile and flour mills.

As the volume of air drawn into the engine is considerable—about 635 cubic feet per minute for a 100 h.p. engine having a four-stroke cycle and about 850 cubic feet per minute for an engine having a two-stroke cycle—especially in large installations, means of admitting an excess of air to the engine-room must be provided. However, the noise will probably be considerable and the windows will vibrate and shake under the continuous waves produced by the periodic air displacements. It is therefore a better plan in large installations to draw the air from the outside through large conduits built in the foundation and connecting with the different air intakes to the valves.

Two-stroke engines are provided with air through the air (scavenging) pump, so it is necessary merely to have the pump intake connected with the air canal.

Wherever the air is likely to be contaminated with dust, it should be filtered to prevent excessive cylinder wear and the shortening of the life of the engine.

#### EXHAUST PIPES

The exhaust pipes should be of cast iron, as steel pipes corrode rapidly, especially when the fuel oil contains an appreciable quantity of sulphur. The sulphur burns to sulphur dioxide, which may be oxidized to the trioxide in the engine cylinder, and combine with the water vapor of combustion to form sulphurous or sulphuric acid. The exhaust gases should never be cooled to the condensing point of water, which would cause corrosion. As the exhaust gases issuing from the engine are hot (600 deg. to 1,000 deg. Fahr.), the exhaust pipes are jacketed and water-cooled in the proximity of the engine to make work around the engine bearable to the attendants and to prevent burns.

It is customary to provide a test cock in the exhaust pipe near the cylinder head. By holding a piece of white paper over this cock determination can easily be made as to whether combustion is perfect or incomplete. The exhaust should be colorless.

#### STORAGE OF FUEL OIL

As Diesel plants use about one-third the quantity of fuel oil consumed by efficient steam plants, the storage capacity can be proportionately reduced. In the engine-room are one or more small fuel-supply tanks, usually of a capacity to run the engine for half a day. In small installations, a hand-operated fuel pump is used to refill the small fuel tank with fuel oil from the main fuel-oil storage tanks. In larger installations a motor-driven pump is used. Whenever the viscosity of the oil is such that it will not flow readily through the pipes at ordinary temperatures, means to heat the oil to increase its fluidity sufficiently have to be provided. The usual method is to pass the hot jacket water through pipe coils in the small fuel tanks, or to have these tanks provided with water-jackets, through which the hot water from the engine jacket is passed. Provision then has to be made for another smaller fuel tank, in which gas oil (ignition oil) for starting the engine is stored; this is switched on when the engine is to be stopped for any length of time. The fuel supplied to the pipe leading to the engine fuel pumps is controlled from either supply tank by a three-way cock.

When the fuel oil contains sand or other foreign matter, small filter tanks are provided; the fuel oil from the small fuel-supply tank flows through these filter tanks into the main fuel-supply pipe to the engine fuel pump through two branches (one from each filter tank) controlled by a three-way cock. This arrangement permits switching one tank off the circuit for cleaning while the other continues to supply the engine with fuel. As an additional safeguard, filter plugs are placed ahead of the intake valves of the fuel pumps.

The fuel tanks are supported on brackets or a platform on the wall opposite the engine and high enough above it for the fuel to flow by gravity to the engine fuel pumps. Usually each engine is supplied from its own small fuel-supply tank.

# A 32-Foot Stock Cruiser to Be Marketed at a Reasonable Price

By William Atkin

THE plans of the 32-foot cruiser herewith illustrate the appearance and general cabin arrangements of a craft that will be manufactured on a quantity basis by Robert B. Patrick, of Jamaica, L. I. Mr. Patrick has made a study of the problem of creating and supplying a popular boat at a popular price, and just as soon as a suitable and an accessible site can be secured will erect a boat building factory—not a shop—wherein, so to speak, materials will enter at one end and completed boats of one size and kind immerge from the other.

The boat determined upon is of the following dimensions: L.O.A. 32 feet, L.W.L. 31 feet 5 inches, width 9 feet 3 inches, draft 3 feet 6 inches, and of the round bilge type.

The materials entering into the boat's construction will be of selected woods and as follows: Keel white oak  $3\frac{3}{4}$  inches thick by 8 inches, and in a single length; the frames will be of steam bent  $1\frac{1}{4}$  x  $1\frac{1}{4}$ -inch white oak;

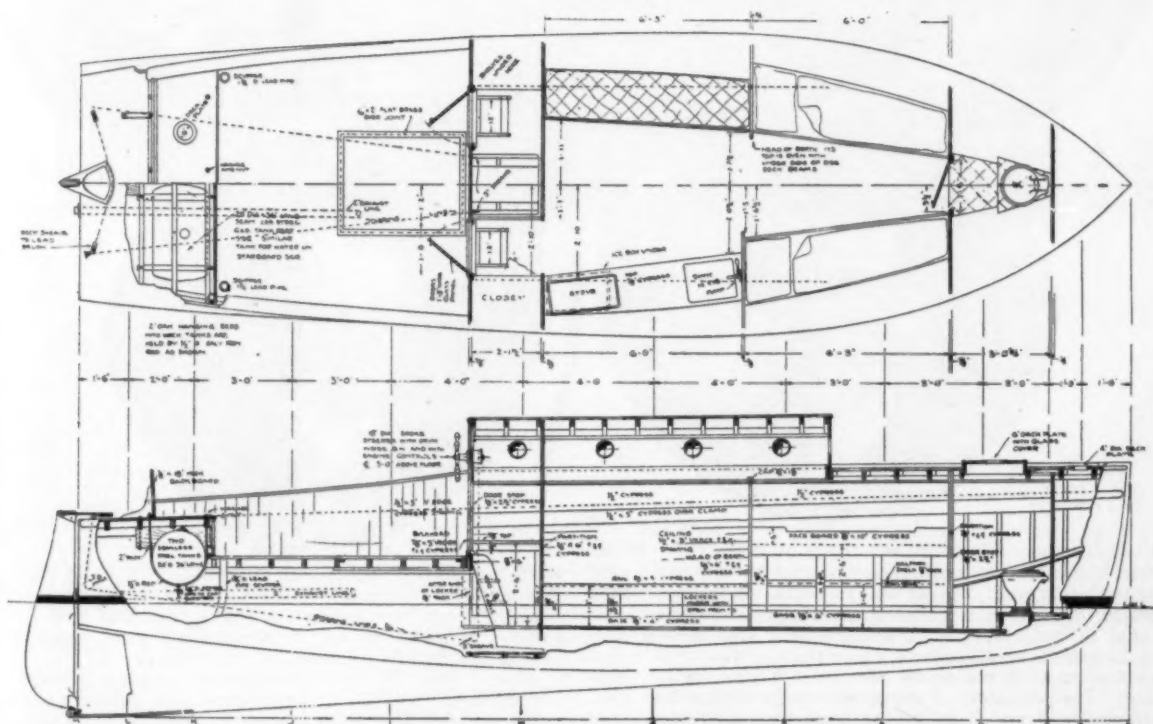
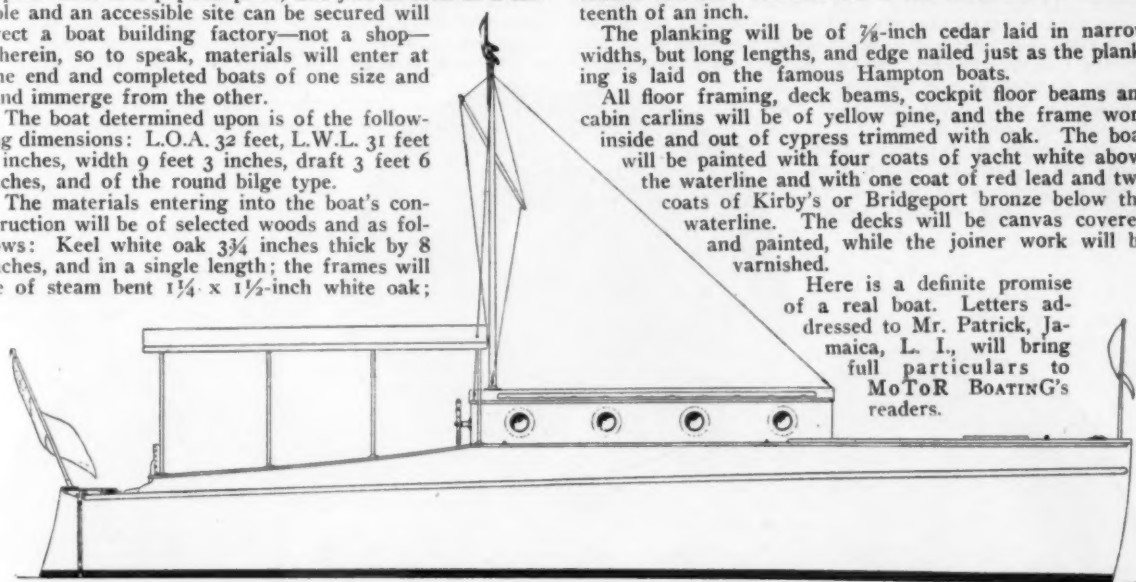
the stem of hackmatack; the stem of oak, and all clamps and stringers of single length yellow pine.

It may not be amiss to mention that the keel stem and stern will be set up in a specially designed, and patented, mold that also serves as a metal model within which the frames are also bent and set to the exactness of one-sixteenth of an inch.

The planking will be of  $\frac{3}{4}$ -inch cedar laid in narrow widths, but long lengths, and edge nailed just as the planking is laid on the famous Hampton boats.

All floor framing, deck beams, cockpit floor beams and cabin carlins will be of yellow pine, and the frame work inside and out of cypress trimmed with oak. The boat will be painted with four coats of yacht white above the waterline and with one coat of red lead and two coats of Kirby's or Bridgeport bronze below the waterline. The decks will be canvas covered and painted, while the joiner work will be varnished.

Here is a definite promise of a real boat. Letters addressed to Mr. Patrick, Jamaica, L. I., will bring full particulars to MoToR BOATING's readers.



Plans of the 32-foot stock cruiser designed by Mr. Atkin



# To Manufacture Marine Motors By Up-to-Date Production Methods

The Long Established Murray and Tregurtha Company of Boston  
Reorganized and Moved Into a New Factory at Atlantic, Mass.

**A**BOUT thirty-three years ago, John A. Murray and George Tregurtha formed a partnership, known as the Murray & Tregurtha Company, opened up a small machine shop in Boston and entered the designing and building of steam engines for yachts and small work boats. Three years after they opened business, George Tregurtha designed his first internal combustion gas engine and after many days of arduous work the Murray & Tregurtha company finished their exhaustive tests on a heavy-duty marine engine which is known the world over for its reliability and efficiency.

The Murray & Tregurtha company have gradually grown until they became one of the leading boat and engine builders in the

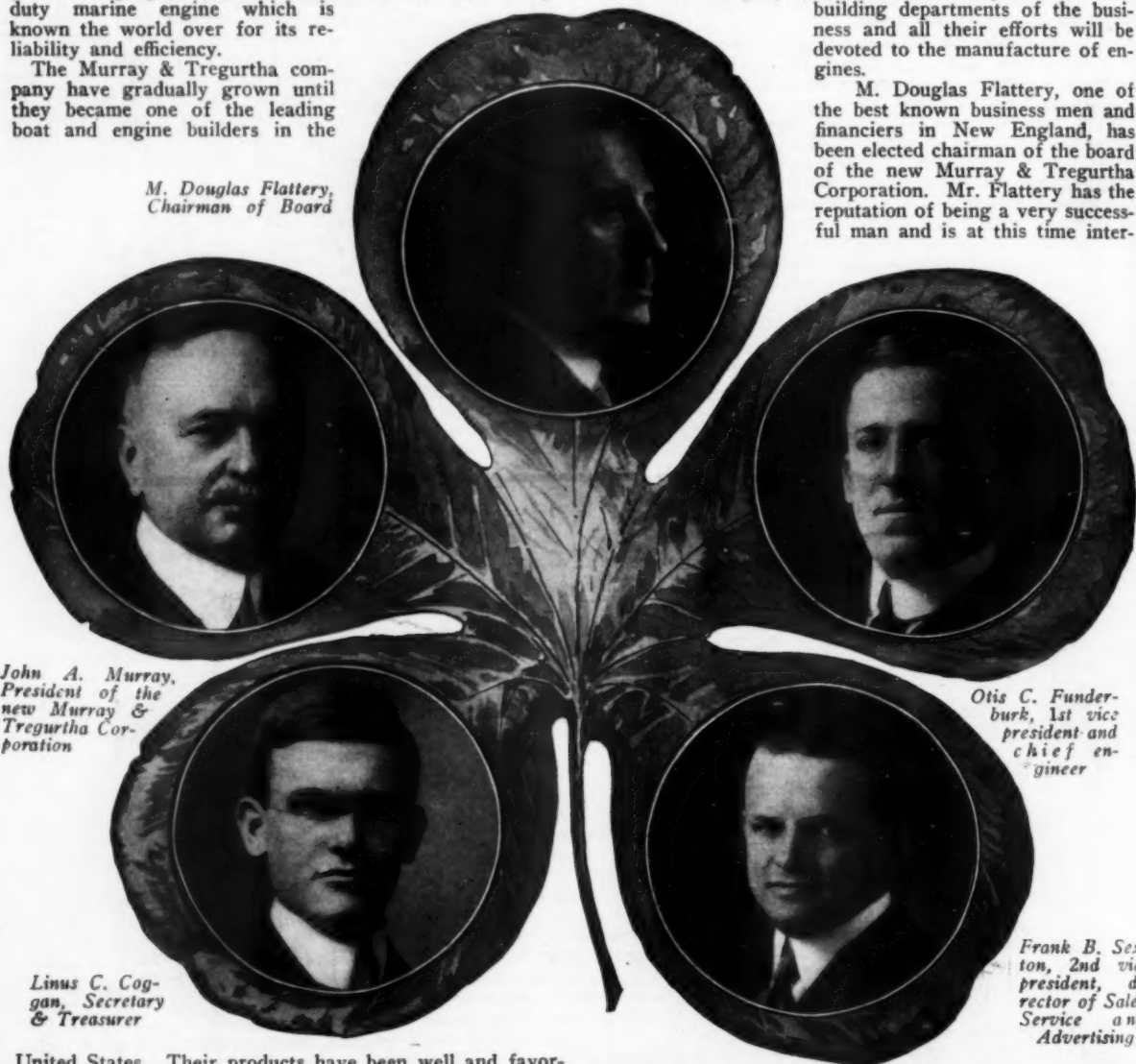
The Murray & Tregurtha Corporation are just completing their new factory at Atlantic, Mass., which when completed will be the largest factory in the United States devoted exclusively to the manufacturing of marine internal combustion engines.

The new factory will be equipped with all up-to-the-minute machinery and such production equipment as is necessary to manufacture their engines on a large scale.

The new company has eliminated the yacht and boat building departments of the business and all their efforts will be devoted to the manufacture of engines.

M. Douglas Flattery, one of the best known business men and financiers in New England, has been elected chairman of the board of the new Murray & Tregurtha Corporation. Mr. Flattery has the reputation of being a very successful man and is at this time inter-

*M. Douglas Flattery,  
Chairman of Board*



*John A. Murray,  
President of the  
new Murray &  
Tregurtha Cor-  
poration*

*Otis C. Funder-  
burk, 1st vice  
president and  
chief en-  
gineer*

*Linus C. Cog-  
gan, Secretary  
& Treasurer*

*Frank B. Sex-  
ton, 2nd vice  
president, di-  
rector of Sales,  
Service and  
Advertising*

United States. Their products have been well and favorably known throughout the entire country and it is only natural that the Murray & Tregurtha company would branch out into a large productive organization.

On February 1, 1919, a new company was incorporated to take over the Murray & Tregurtha Company. This organization is known as the Murray & Tregurtha Corporation. The personnel of the former organization has been strengthened materially by the acquisition of some of the leading talent in the marine engine field.

ested in many such successful enterprises as the Old Colony Woolen Mills Company, the Loew's Theatres Company, and is also director in a number of banks, trust and steel companies. Mr. Flattery will be the guiding hand which will control the policies of this new corporation.

John A. Murray is the president of the new Murray & Tregurtha Corporation and was one of the pioneers of this business. Mr. Murray is internationally known as one of

(Continued on page 72)

## Propellers in a Nutshell

Giving for the first time full details concerning the Columbian motorship and heavy work boat wheels, the Columbian Bronze Corp., of New York, has issued a new catalog, calling it *Propellers in a Nutshell*. This company has lately received an order for 366,000 pounds of bronze propellers from the Emergency Fleet Corporation, a contract of approximately \$100,000, it being the intention of this Government shipbuilding agency to construct their new vessels with bronze propellers and to replace some of the iron and steel ones now in service on other vessels with bronze ones.

The catalog is of forty-eight pages, and contains a mass of information of real interest to every owner and prospective owner of a motor boat. At the back of the catalog are valuable tables covering the speed of boats in miles per hour in relation to the diameter and pitch of the propeller used. Also a time

## Yard and Shop

### Notes of Interest to Both Owner and Manufacturer

twelve years has been connected with the Cadillac Motor Car Company, and lately as factory manager and builder of the Cadillac Liberty Motor and the famous Cadillac-8.

Mr. Blackburn enjoys the distinction of being one of the greatest intense production experts, manufacturing the highest grade motors in the world. He received his early training as a mechanic in the factory of Browne & Sharpe, of Hartford, Conn., and later was connected with the Burroughs Adding Machine Company.

The new Gray four-cylinder,  $3\frac{1}{2} \times 5$  gasoline or kerosene marine motor, will be manufactured entirely under the supervision of Mr. Blackburn. The Gray Motor Company feels that its customers are very fortunate in having the

the history of the engine business, not because it was such a good motor, but because it was produced in such great volume, at a comparatively low price, and has given such universal satisfaction and was the first eight-cylinder motor to come out in this country.

## A New Sedan Type for Commuters

A new type of sedan to be used in commuting between summer homes and nearby cities has been developed by the Great Lakes Boat Bldg. Corp., of Milwaukee, Wis., and one is now being constructed at Milwaukee for C. C. Pape, of St. Louis and New York. This craft is designed to make 40 m.p.h., and for that purpose is powered with a pair of eight-cylinder Van Blerck engines. In order to afford comfort for the owner, the main cockpit is placed forward of the engines, where it will be free from noise. This cockpit is completely enclosed with a



The sales force of the International Magazine Company which is responsible for giving MoToR Boating practically twice the circulation of any other publication in the marine field. This force of salesmen at a recent conference held in New York City was given instructions to obtain a circulation of 30,000 for MoToR Boating before December 31 of this year. This means a still further increase in circulation of about 50 per cent. The names of those persons in the illustration are as follows: First row (left to right, from the top): C. H. Eiser, Jr., New York City; Russell Holt, New York City; J. H. Barr, Boston, Mass.; E. A. Flynn, New York City; C. M. Gunnison, Chicago, Ill.; Geo. E. Houston, Atlanta, Ga.; W. M. Eldridge, New York City; C. I. Togstad, New York City. Second row: W. G. Sullivan, Atlanta, Ga.; J. W. Kenney, Chicago, Ill.; Mat Sullivan, Boston, Mass.; E. W. Cox, New York City; G. Johnston, New York City; J. A. O'Connor, Los Angeles, Cal.; K. V. Krembs, Toronto, Can.; J. M. Eisenlord, Chicago, Ill.; D. M. Wall, New York City; B. H. Totsek, San Francisco, Cal.; C. H. Mason, New York City. Third row: Miss A. E. French, New York City; Miss R. Terrill, Chicago, Ill.; W. R. Brown, New York City; J. H. Schnackenberg, New York City; J. D. Dargon, New York City; P. H. Nystrom, New York City; T. D. Rodlum, New York City.

and speed table whereby it is easy to figure the speed of a boat after either the statute or nautical mile. Copies will be sent to those interested who mention MoToR Boating.

## Blackburn Now Manager of Gray Motor Co.

Continuing its policy to furnish its customers with the very best mechanical ability it is possible to secure, the Gray Motor Co., of Detroit, Mich., has secured W. R. Blackburn, who for

services of a man of Mr. Blackburn's long experience and success. The development of motor building has taken tremendous strides in the last few years. The fact that it is possible to produce an eight-cylinder motor like the Cadillac, in spite of the contention that the multiple-cylinders would increase the possibilities for trouble, has proven that there is no limit to what can be done in manufacturing when the right men undertake the job.

The production of the Cadillac-8 was one of the most wonderful feats in

special automobile top made by the W. S. Seaman Company and will comfortably take care of ten persons. The engineer will operate his engines from an after cockpit. Should the owner desire the pleasure of driving his boat at high speed, he need but reach out for his controls, which are brought to the forward cockpit for that purpose. The power plant is housed in under a trunk cabin, which allows full headroom in the engine compartment. A toilet is provided under the main deck with a door opening into the forward cockpit.

## Let There Be Light

Nothing adds more to the terror of those on a sinking ship than darkness. During the war when a vessel was torpedoed at night and the engine-room was flooded or the engineers were forced to abandon their posts and the craft was plunged into the black shroud of impenetrableness, many lives that might have been saved were lost because of the difficulties in launching boats without lights. Persons who might have been placed aboard these boats lost their way in the maze of passages and compartments below decks; injured were overlooked and could not be found; while the wireless set that should have been speedily summoning assistance was perforce silent.

In order then that this danger and confusion might be eliminated on the transports conveying the American troops abroad, the Emergency Fleet Corporation began looking around for an auxiliary electric plant that would furnish the current in just such emergencies. It was decided that the plant would have to be compact enough to be stored as far from the possible danger point or the place where the water would flood the ship and the Government experts decided that the Matthews Engineering Co., of Sandusky, O., should devise and construct these plants.

This firm had already produced sets of a similar nature ideal for peacetime purposes, and the Government engineers believed that it could produce just what they wanted for war-time work. Additions to the Matthews plant were necessary, and one new building alone was constructed with 18,000 feet of floor space, while the whole enterprise expanded into four times its original size. This, however, did not delay work on the lighting plants, and while one section of the factory was going up other sections were turning out the plants. The plant was made compact enough to be placed on the upper deck of the ship, where it would be practically out of harm's way and furnish current as long as the ship was afloat.

The Shipping Board required absolutely automatic functioning plants;

a plant which did not lose its head in the moment of greatest excitement, not for one-tenth of a second might its potential waver when the precious auxiliary wireless current is required.

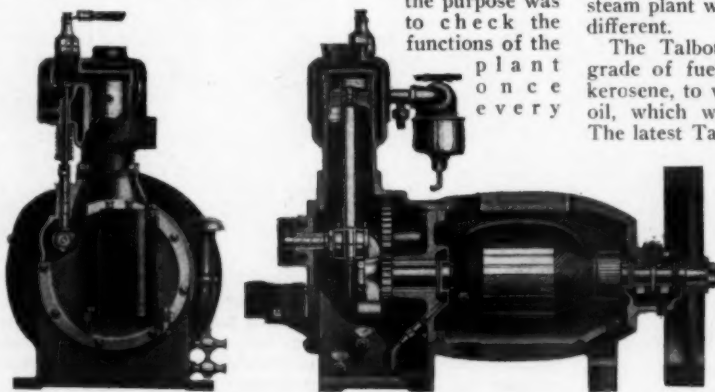
The auxiliary plant consisted of a 6 k.w. General Electric generator direct connected to a Standard Matthews 3½x5, four-cylinder, overhead valve engine, operating at a speed of 900 r.p.m., automatically started and governed, and automatically stopped. There was a 56-cell, 110-volt, 128-ampere hour, Willard storage battery connected with the plant for starting. This was all controlled by the Matthews full automatic switchboard, which contained



Hog Island—The big shipbuilding establishments installed the Matthews lighting plants as the ships were constructed

all the instruments of their domestic automatic board which they built for years and a number of special functions required for the application to a ship. Among other things was a time clock; this was locked and under the control of the chief officer of the ship. He could set the adjusting dial of the clock and the plant would start once every twenty-four hours at the time he set it and run for twenty minutes. This operation was entirely automatic, and

the purpose was to check the functions of the plant once every



The new automatic lighting plant of the 32-volt type of the simplest possible kind of direct connection of a generator to an engine which has been developed by the Matthews Engineering Co., of Sandusky, O. The generator frame and engine crankcase are cast integral. The engine is a four-cycle, water-cooled type having a 2-inch bore, and 3-inch stroke. The plant is guaranteed to have 35 per cent. overload capacity. A 60-ampere hour willard glass cell storage battery is used

twenty-four hours without the element of human intervention of any kind.

## Champion Boosts Motor Shows

Carrying out a consistent poster campaign, advertising the automobile shows in practically every city in the United States where an event of this kind was held, the Champion Spark Plug Co., of Toledo, O., has done its best to give publicity to the exhibitions. In carrying out this plan the Champion people were guided by the old axiom that "nothing succeeds like success." In other words they figured that if the

event proved a big success, everybody and everything connected with it would derive some benefit from it.

The poster used was of the 24-sheet variety, specially designed and printed in seven colors. This co-operative form of advertising has made a big hit, especially among the members of the various automobile associations who are instrumental in promoting the shows. It also appealed strongly to the Champion Spark Plug dealers, as it gave them an excellent opportunity to boom their sales of spark plugs by linking up their local advertising with this poster showing.

## Steam Plant for Small Boats

Steam is the most flexible source of power. The steam engine, therefore, is truly the engine of a thousand variable speeds. Ordinary steam power plants are so bulky that their use has largely been discontinued where compactness is of importance. The Talbot Engineering Corporation have developed a steam plant which they state is entirely different.

The Talbot boiler is suited to any grade of fuel, from light oil, such as kerosene, to very heavy thick Mexican oil, which will hardly flow in pipes. The latest Talbot boilers are also fitted for using coal and other solid fuels. About the same quantity of these cheap grades of fuel are used in a Talbot steamer as is required in gasoline to operate an ordinary gas engine.

Tests on Talbot Steamers show a fuel consumption between one-half and three-quarters of a pound of crude oil per shaft horse power. The Talbot engine is up to date in



machine design, closed-in running parts, all bearings are adjustable and are locked with castle nuts. All the wearing parts are easily removed and are interchangeable.

The Talbot power plant is interesting not only for its compactness, but even in the small sizes, the thermal efficiency is higher than that of the largest electric power stations. These power plants also operate at a greater thermal efficiency than the machinery in the largest steam ships. This is due to the high pressure superheated steam which is used.

The element of safety is also very important in using steam power plants. It is impossible to do damage by explosion of a Talbot boiler, as there are no large steam spaces, such as steam domes, boiler shells, in the ordinary sense. The reserve capacity of the Talbot boiler compares favorably with the express type boilers used in Navy destroyers, yet the element of danger is eliminated due to the lack of large pressure containers. The Talbot power plant, its manufacturers claim, operates on about 10 to 20 percent of the cost of an ordinary gas engine.

### Navy to Sell Motor Boats

The Navy Department advises that ten more of the motor boats which were taken over for war purposes will be offered for sale May 1. These are all well known boats powered with engines of standard make. They are:

Name	Length	Power
Sea Hawk.....	62	360-400 h.p. motors
Grey Fox.....	48	Two 280 h.p. motors
Pope Mary.....	51	One 60 h.p. motor
Traveler.....	50	One 25-35 h.p. motor
Zig Zag.....	44	One 140 h.p. motor
Kanised.....	90	One 150 h.p. motor
Grey Hound.....	39	Two 150 h.p. motors
Howarda.....	69	Two 32-37 h.p. motors

Sealed proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12 o'clock noon, May 1, when they will be publicly opened. Full information and specifications of the boats may be obtained by addressing the bureau.

### Gitana Sold to Walter L. Todd

The standardized 50-foot military type express cruiser Gitana, designed and built by the Great Lakes Boat Bldg. Corp., of Milwaukee, Wis., about a year ago, has been sold to Walter L. Todd, of the Todd Protectograph Co., of Rochester, N. Y., so that this year Rochester will be represented by a new express cruiser of the latest type. Mr. Todd has had an eight-cylinder Model F 200 h.p. 5½x6¾ Sterling engine installed.

### Plans For Amateur Builders

A booklet has been issued by the John L. Hacker Boat Co., of Detroit, Mich., describing its plans drawn especially for the amateur mechanic. These plans are divided into three classes and are intended to cover every want. The first is the Sea Wolf type and is for boats ranging from 18 to 30 feet; the second is the Special Speed Type of 16, 21 and 26-foot designs; and the third is the Hoosier type.

These plans are all for 1919 and are the latest works of John L. Hacker who has specialized in V-bottom speed runabouts. The plans of the boats in the second class are improvements on Mr. Hacker's famous design that won the Mississippi Valley Association races, while those of the third class are for boats of over 30 m.p.h. These are based on Hoosier IV, designed by Mr. Hacker, which won the Southern Displacement Championship events at Miami in February, and is the holder of the A. P. P. A. record as the fastest displacement boat afloat. The booklet may be obtained by writing the company and mentioning MoToR BOATING.

### Standard Lightship Towed by 26-Footer

Towing a standard 100-foot lightship about the harbor of Buffalo; pulling a spar buoy 14 feet square by 30 feet long attached to a concrete sinker weighing 1,400 pounds out into Lake Erie, dragging bottom with the anchor on it, for three miles to mark the entrance to the channel for traffic down the Niagara River; and finally carrying a ton of cargo in her after cockpit without settling at the stern, are some of the remarkable performances of the pioneer of the little motor boats now being adopted by the Government as light-house tenders.

This pioneer craft was designed by Mr. Hotchins, of the Lighthouse Department, of Buffalo, N. Y., and measures 26 feet overall. She has a beam of 7 feet, 6 inches, a 4-foot draft of hold and displaces 7,500 pounds. It was designed on a block co-efficient of .763 and the co-efficient of the load waterline is .60. The power plant is the Model D 12-15 h.p., two-cylinder, four-cycle Sterling engine, which develops 11½ m.p.h., over a measured course. This boat has been running the entire season of 1918, operating as a tender to Lightship No. 98. There is not a straight line on her.

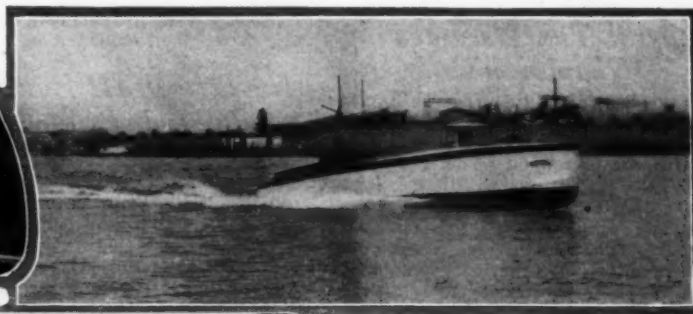
### Hounding the Hun from the Seas

The Elco Works of the Electric Boat Co., of Bayonne, N. J., have issued such a handsome and elaborate brochure under the above title that it is hard to believe that it is intended for advertising purposes. In fact, one would never know that it was advertising if it was not for a little paragraph at the end of the brochure explaining

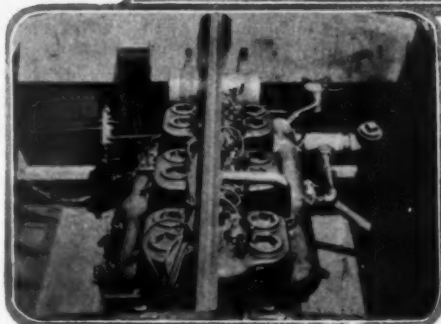


Herbert Fielder, the owner's chauffeur built the boat during his spare moments from a knock-down model shipped from the Richardson shop at North Tonawanda, together with frames, planking, and the entire hull construction

Powered with a six-cylinder, 5½-inch Sterling engine, Nita is a very speedy boat for her class, travelling well over 30 m.p.h.



Nita is a 30-footer with a beam of 6 feet 4 inches, designed by Wm. H. Hand, Jr., for Mrs. Litcher, of Orange, Tex. This was a most inexpensive boat and this plan of building at home is an excellent one for those who wish to save money



the part the Elco people played in the hounding process.

The brochure is by an anonymous Lieutenant of the British Royal Naval Volunteer Reserve with notes from Lieutenant E. P. Dawson's book, *Pushing water*. The illustrations are from paintings in the London Graphic and photographs by Underwood & Underwood. The subject is written in the form of an adventurous narrative and generously interspersed with the illustrations. The printing, makeup and paper leave nothing to be desired.

### *Commodore Walker's New 40-Foot Runabout*

Vice-Commodore H. J. Walker, of the Cleveland Yacht Club is having a runabout constructed by the Matthews Boat Co., of Port Clinton, O., which is said to be one of the most notable new designs of the season. It is a 40-footer, large enough to travel in open water at a speed comparable to the destroyers and absolutely has her ability to maintain her top speed on runs as far as from Cleveland to Detroit. The motor is a Model F eight-cylinder, 180-200 h.p. Sterling, which will turn 1,400 r.p.m., all day long under load.

### *Bruns, Kimball, & Co. Move*

Following their previous announcements Bruns, Kimball & Co., have moved from their old location, 115 Liberty St., to 153-55-57-59 West 15 St., where they have quarters three or four times larger than the old ones. The ground floor, where the store is has a show window front of 85 feet on 15 St., and a depth of 110 feet. This, together with another room of the same size on the premises, makes a display room of over 18,000 square feet and is termed a continuous engine show.

### *Federal Tax Assumed by Champion Co.*

Two days after the Federal Excise Bill which levies a five percent tax on all automobile accessories became effective, the Champion Spark Plug Co., of Toledo, O., wired its jobbers throughout the United States that the company would assume this tax and that it would not be added to the customers' price on sales. Coming at a time when most jobbers and dealers were all at sea as to how the tax would affect them, it meant that every jobber could forget the Excise Tax as far as these spark plugs were concerned as the dealers' cost and selling price would not be disturbed. It also meant in the end that the public would not have to pay this extra five percent.

### *American Bosch Activities*

The first sales convention held by the new Bosch company, the American Bosch Magneto Corporation, was held recently at the company's main plant, Springfield, Mass. The first morning

was given to an automobile trip to show the visitors the interesting points of Springfield, while the afternoon was given over to the inspection of the works and the evening to departmental business at various clubs. The next two days were devoted to the discussion of trade matters, review of new products and a banquet was also held at the Naysset Club for the 100 executive and department heads. The executives of the new company who addressed the convention included: A. T. Murray, president; Geo. A. MacDonald, treasurer; A. H. D. Altree, vice-president; J. A. McMartin, secretary; A. H. Bartsch, general sales and advertising manager; G. H. Lang, assistant to the president, and F. D. Norman, factory manager.

The following were the executives and department heads who were among those attending:

Paul Furrer, branch manager of San Francisco; William B. Brown, branch manager; A. C. Wilson, assistant; E. J. Swanson, district supervisor of sales; G. Redemsky and F. J. Bartella, sales engineers, all of Chicago. T. C. Miller, branch manager; O. S. Stanley, assistant; L. B. Smith, district supervisor of service, and S. Hillman, sales engineer, all of New York. M. Tost, branch manager; A. C. Heyser, assistant; and Edward Frazer, sales engineer, all of Detroit.

Changes in the Bosch personnel include: W. G. Brown, transferred from New York to Chicago, as branch manager; T. C. Miller, former assistant branch manager at Detroit, has been made branch manager at New York; Harold A. Wilson, formerly of the Diamond State Fibre Co., was added to the Chicago office as assistant branch manager; A. C. Hyser, formerly in charge of service of the Willard Storage Battery Co., joined the Detroit office as assistant branch manager; Oliver S. Stanley, formerly assistant manager of the St. George Paper Co., Norwalk, Conn., joined the New York office as assistant manager.

### *Miss Detroit III Equipped with Hyde Propellers*

When Miss Detroit III recently captured the Gold Challenge Cup at Detroit, it was the fifth consecutive year that this famous trophy had been won by boats equipped with Hyde wheels. In 1918 Miss Detroit III was also the winner of this trophy, while in 1917, Miss Detroit II carried it away. In 1916 Miss Minneapolis was the winner, and in 1915 it went to Miss Detroit, and finally in 1914, Baby Speed Demon II was awarded the trophy, all of which boats were Hyde-equipped, using the turbine type propellers.

The above information was furnished by W. C. Disbrow, Jr., of 71 Cortlandt St., New York, agent for the propeller, who added that Aeolus, winner of the Detroit News Trophy, and Hoosier IV, winner of the Open Displacement Races at Miami and Whip winner of the Miami Cruiser Championship, were also so equipped.

### *Great Lakes Designs Standardized 43-Foot Cruiser*

With the construction for Kingman N. Robins, of Rochester, N. Y., of the first of its 43-foot standardized express cruisers, the Great Lakes Boat Building Corp., of Milwaukee, Wis., has begun to turn out this model, designed to follow standard lines. The Great Lakes shops, where the boats are evolved, contemplate the use of oak keel, sawn frames with steam bent oak ribs, fore and aft spruce battens, running fore and aft from stem to transom, clear white cedar planking.

A six-cylinder Model M, Van Blerck engine will give it a speed of 20 m.p.h.

There are to be two cabins, with the main one forward, where also is located a galley and toilet. The engine-room extends partly under the bridge deck and has a double laminated water-tight bulkhead forward and aft. The after cabin is just behind the engine-room. The bridge deck is designed to be comfortable and roomy, and is supplemented by the cockpit aft. The floor of the cockpit is above the waterline, but self-bailing scuppers are provided anyway. This space is large enough for four yacht chairs, although it is equipped with a deep lounging seat with tufted leather-cushion built across the after section. The cabins are finished in white enamel with mahogany trim and are the last word in moderate luxury. A second toilet is also provided aft.

### *Activities of the Buffalo Herd*

New distributing agents for Buffalo gasoline motors have been appointed in various places in the United States and Canada.

In the Philadelphia district Walter S. Carmen has been made exclusive distributor. Mr. Carmen has long been identified with the marine engine business. For a number of years he was a member of the firm of Carmen & Howes, general marine agents and engineers, and later was in Government service, being released January 1. His office and sales room will be located in the Bource building.

The Minneapolis territory will be handled by the Enterprise Machinery Company of that place. This company formerly manufactured the Westman engine, which they have discontinued.

The A. R. Williams Machinery Co. will look after the Toronto territory. This firm, located at 64-66 Front St., in that city, is one of the largest machinery houses in Canada, with branches throughout the Dominion and a large staff of engineers and service men at their call.

James C. Wilson, who for several years has sold Buffalo engines in the Toronto territory with considerable success, will continue his activities along that line. The new arrangement with the Williams people is not to conflict with Mr. Wilson, who will continue to handle the engines.



*HOOSIER IV—Express runabout, seating five persons. Designed by John L. Hacker. Built by John L. Hacker Boat Co., Detroit. Owned by H. R. Duckwall, Indianapolis. Has a speed record of 40½ miles per hour and won two races at Miami.*

## Four generations of Valsparred Hoosiers

WHEN John L. Hacker designed the great-grandmother of the *Hoosier* family, he made her a thing of grace, beauty and speed—and he Valsparred her, of course.

Then came *Hoosier II* and *Hoosier III*. Mr. Hacker made some clever improvements in each of them; but he decided that he simply *couldn't* improve the varnish—so they were Valsparred, also.

Now we have with us *Hoosier IV*—youngest, speediest, flower of the flock. And is she Valsparred? She is—of course she is!

The *Hoosiers* certainly have the

Valspar habit—like thousands of other water-craft, from the palatial yacht to the humble canoe and row-boat.

For Valspar is the ideal boat varnish—and experienced boat owners and builders know it.

Water-proof and weather-proof—“the varnish that won't turn white.”

Sold by paint, hardware and marine supply stores everywhere.

Send for booklet “How to use Valspar on Boats.” It's free.



### VALENTINE & COMPANY

456 Fourth Avenue, New York

ESTABLISHED 1832—Largest Manufacturers of High-grade Varnishes in the World

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TRADE MARK  
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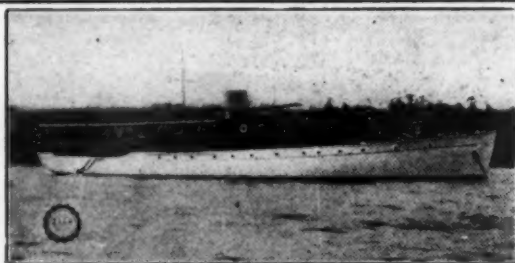


Naval Architects  
and  
Yacht Brokers

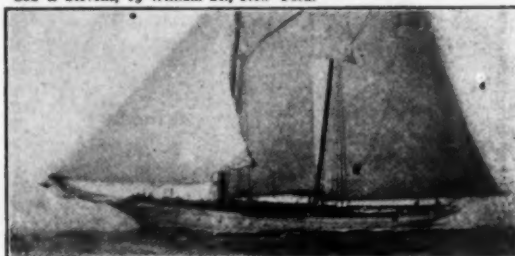
# COX & STEVENS

15 William St., New York  
Telephone—1375 Broad  
Cable—BROKERAGE

We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.



No. 2356—For Sale—Particularly desirable steel, twin screw cruising power yacht; 126 x 18.6 x 6 ft. Recently built in best manner; exceptionally able craft. Speed 12-14 miles; two 125-150 H. P. 6 cyl. air-starting motors. Large deck dining saloon; main saloon, five staterooms, two bathrooms, etc., aft. All conveniences. Handsomely furnished. Cox & Stevens, 15 William St., New York.



No. 148—For Sale—Steel, flush deck, steam auxiliary schooner yacht; 110 ft. overall, 110 ft. waterline, 26 ft. beam, 15.6 ft. draft. Speed under power 9 knots; compound engine; electric lights; all conveniences. Extremely able craft; heavily constructed. Cox & Stevens, 15 William St., New York.



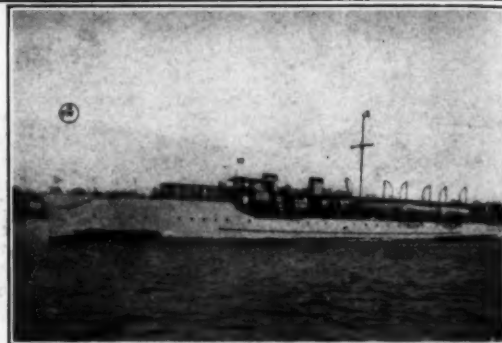
No. 3529—For Sale—Fast bridge deck cruiser; 60 x 10.6 x 4 ft. Built 1916. Speed up to 18 miles; 8-cylinder 215 h.p. Van Blerck motor. Dining saloon containing pullman berth and transom forward; double stateroom aft. Cox & Stevens, 15 William Street, New York.



No. 639—For Sale or Charter—Steel, twin screw power yacht; 111 x 21 x 4 ft. Speed 12-14 miles; Standard reversible motors. Exceptional accommodation; five double staterooms, two bathrooms, large living room, etc. Price Low. Cox & Stevens, 15 William Street, New York.



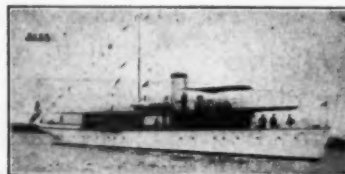
No. 2758—For Sale—Most desirable up-to-date 65 ft. cruiser available. Speed 11-12 miles. Remarkable accommodation, including deck saloon forward, dining cabin, double and single stateroom and bathroom aft. In splendid condition. (Has not been in Government service.) Cox & Stevens, 15 William Street, New York.



No. 978—For Sale—High speed, triple screw, oil burning steam yacht; 165 x 16 x 6 ft. Speed up to 30 miles. Deck dining saloon, four staterooms, etc. Low figure accepted for immediate sale. Cox & Stevens, 15 William Street, New York.



No. 1796—For Sale or Charter—Very roomy, twin screw cruising power yacht, 99 x 17 x 4 ft. Speed 13 to 15 miles; Standard motors. Large dining saloon, six staterooms, three bathrooms, all conveniences. Cox & Stevens, 15 William St., N. Y.



No. 3233—For Sale or Charter—Particularly desirable 123 ft. steel yacht. Speed up to 17 miles. Recent build. Dining saloon and social hall on deck; five staterooms, two bathrooms, etc. Cox & Stevens, 15 William Street, New York.



No. 1806—Bargain—Twin screw power yacht; 67 x 14.6 x 3 ft. draft. Speed up to 13½ miles; two 40 h.p. Sterling motors. Large saloon with two extension berths. 2 staterooms, bath and toilet, etc. Roomy bridge deck and large cockpit. Cox & Stevens, 15 William Street, New York.



No. 2478—Bargain—Roomy twin screw power yacht; 77 x 16.6 x 3.6 ft. draft. Speed 11 miles; two 45 H.P. "20th Century" motors. Two saloons three staterooms, bath and two toilets. Cox & Stevens, 15 William Street, New York.



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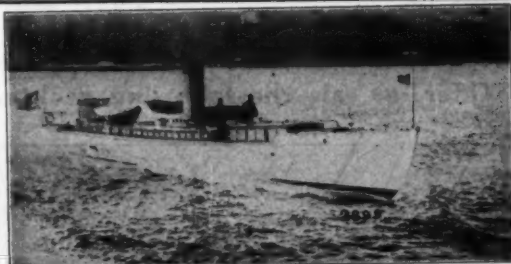
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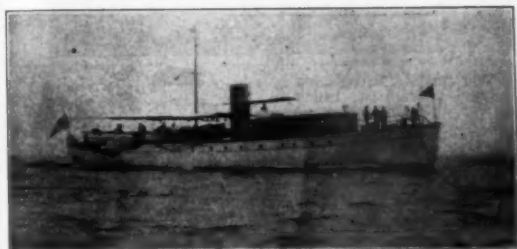
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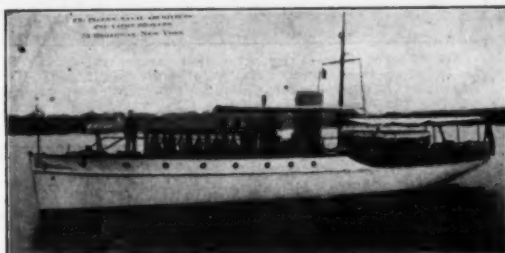
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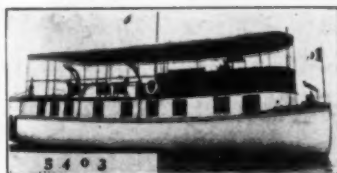
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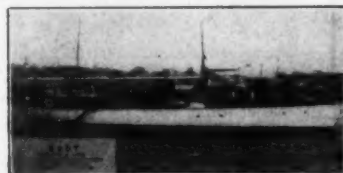
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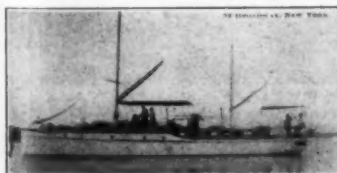
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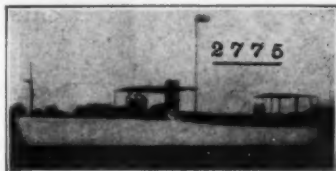
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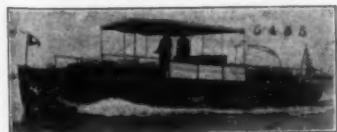
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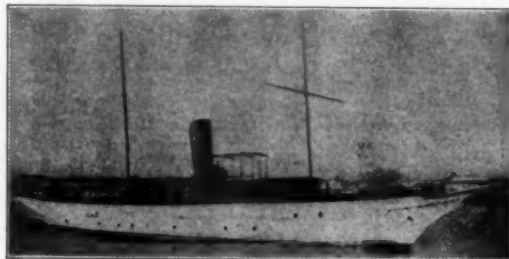
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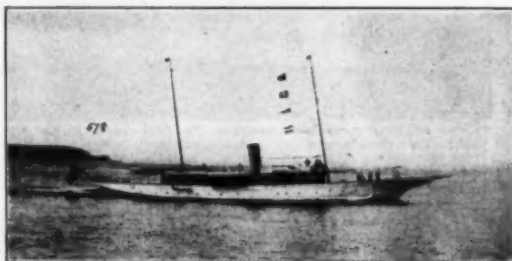
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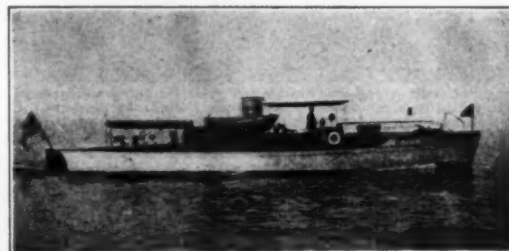
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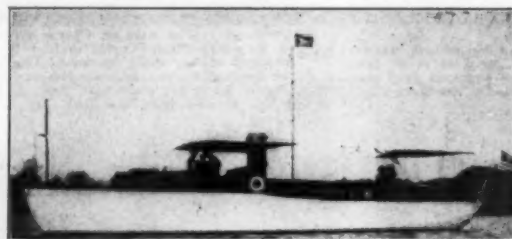
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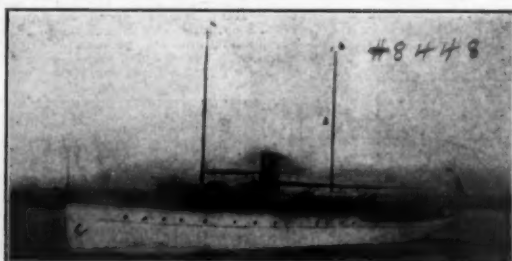
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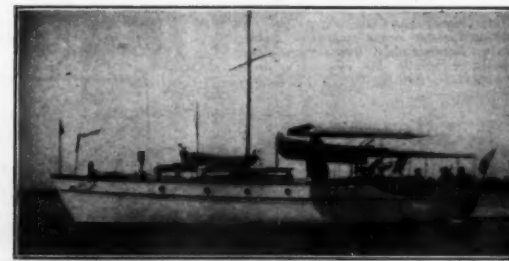
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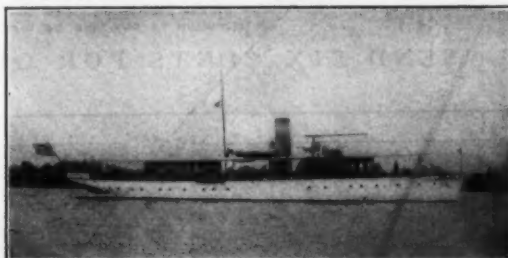
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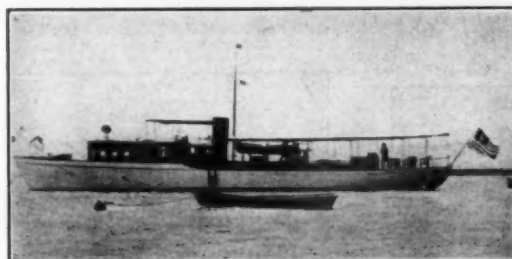
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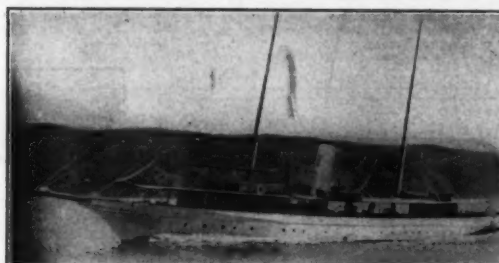
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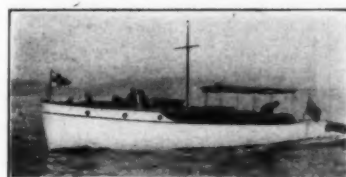
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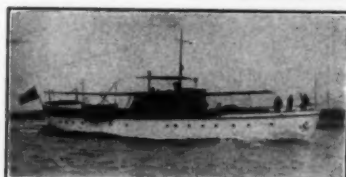
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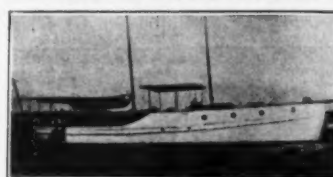
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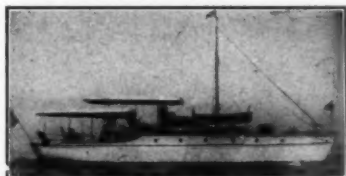
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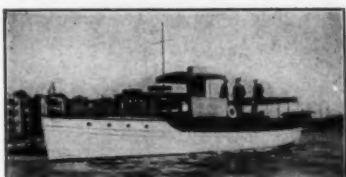
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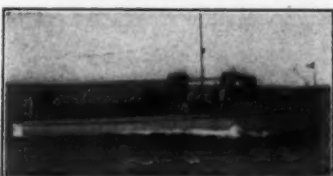
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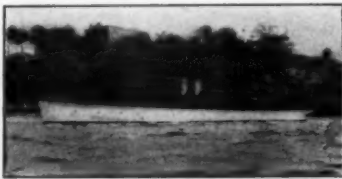
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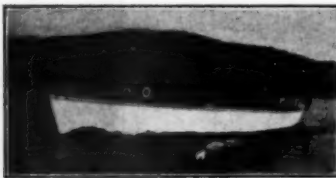
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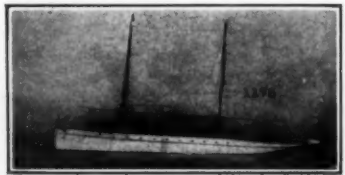
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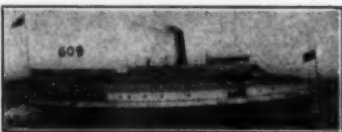
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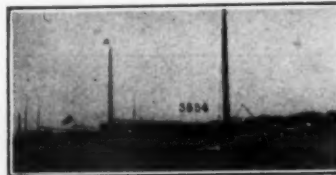
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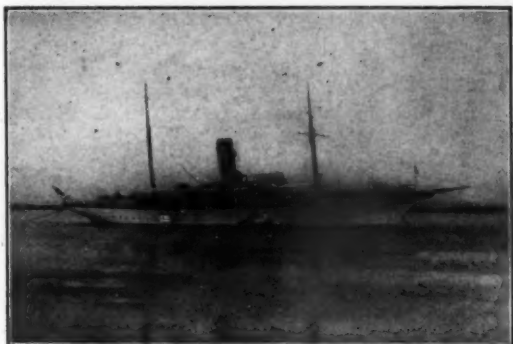
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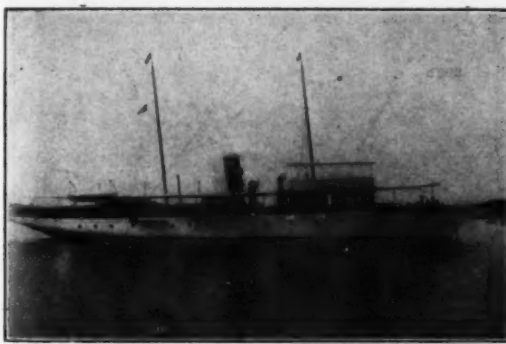
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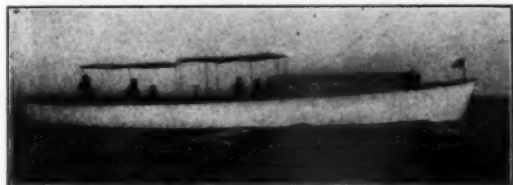
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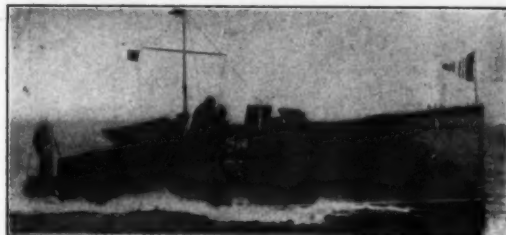
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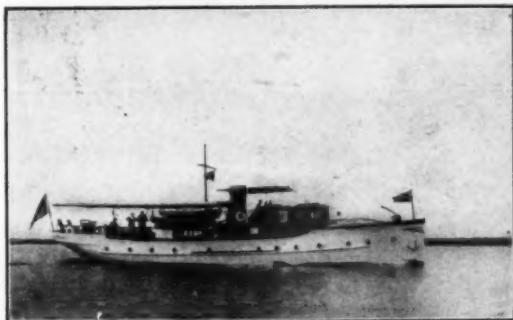
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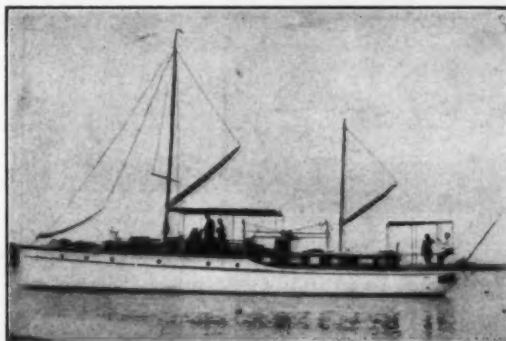
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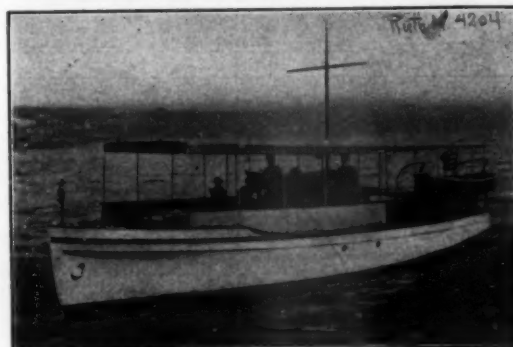
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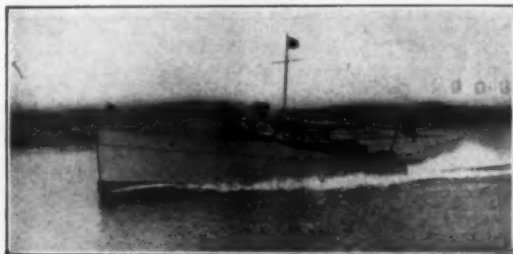
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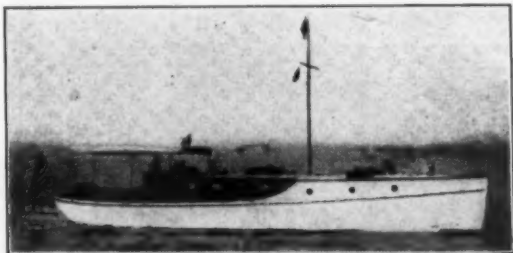
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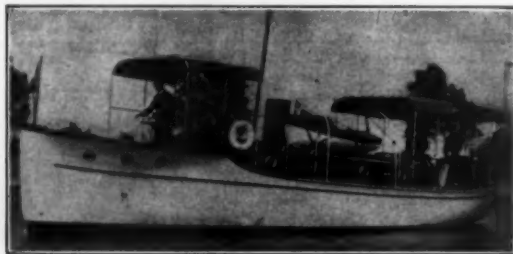
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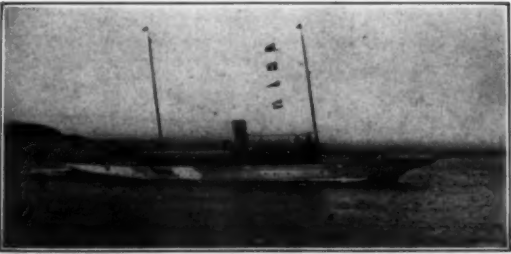
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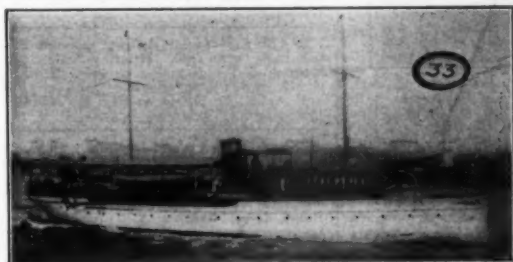
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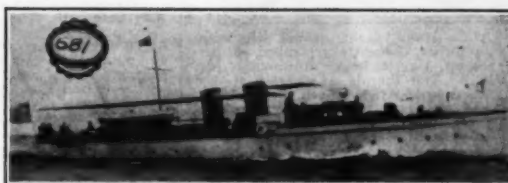
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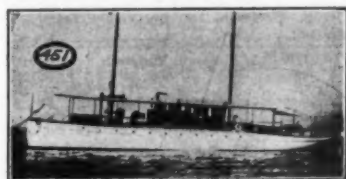
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No. 33—For Sale or Charter.—Modern 98 ft. twin screw power yacht. Four staterooms, two bathrooms. Constructed for use in northern and southern waters. Two Standard motors. Speed fifteen miles. Located Florida.



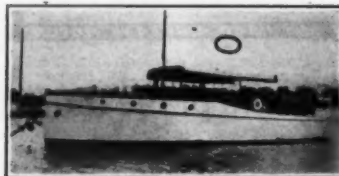
No. 681—For Sale—Very desirable power cruiser, 81 ft. x 12 ft. x 4 ft. draft. 3 staterooms, dining saloon, etc. Six cylinder heavy duty motor. Exceptional offer.



No. 451—For Sale—85' power yacht. Attractively furnished throughout. Equipped for extensive cruising. Two double and one single staterooms. Located Great Lakes.



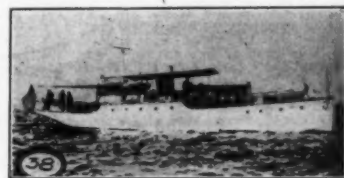
No. 532—For Sale—71 ft. twin screw, flush deck motor yacht. Built by Seabury. Able seaboat. Excellent condition throughout.



No. 106—For Sale—40 ft. power yacht. One double stateroom, dining saloon, galley, two toilets. Speedway self-starting motor. Low price.



No. 683—For Sale—Exceptional 45 ft. cruiser. Speed up to 18 miles. Accommodations 4-6. Excellent condition. Low price.



No. 38—For Sale—Power yacht, 78 ft. x 14 ft. 6 in. x 5 in. draft. Exceptionally able seaboat. Three staterooms aft. Built by Lawley.



No. 548—For Sale—65 ft. power cruiser. Dining saloon, 2 staterooms, etc. A very comfortable yacht for extensive cruising. Low price.



No. 421—For Sale—Offered by estate. 138 ft. twin screw flush deck, steel gasoline yacht. Three single, three double staterooms; two baths. All conveniences. Equipment unusually complete. Speed up to twenty miles per hour. Large cruising radius.



No. 854—For Sale—50 ft. express cruiser. Speed up to eighteen miles. Accommodation 6-8. Excellent condition throughout. Built 1917. Low price.



No. 899—For Sale—52 ft. Express cruiser. Built throughout in best possible manner by Seabury. Large bridge and after deck. Complete equipment. Two double staterooms.

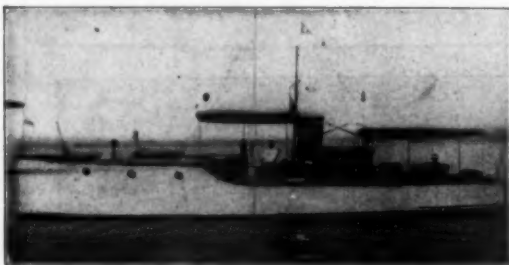
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 Cut one inch deep, one column wide.....\$2  
 Cut 1½ inches deep, 1½ columns wide.....\$5  
 Cut 2¼ inches deep, three columns wide.....\$15

### Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offer of the month. Please mention MoToR BoatingG.



**FOR SALE**—Hand V Bottom 50 x 10.3 x 3. New 1918 and fully equipped. Buffalo Engine 40-60. Bath. Matthews Lighting Plant. Price very low. S. G. Hodgson, 1401 Rockefeller Bldg., Cleveland, Ohio.



**FOR SALE**—Motor yacht, length 55, beam 11, draft 38 inches. Recently replanked. Ralaco 5 x 7, 4 cylinder, 4 cycle, heavy duty motor, just factory rebuilt. Boat thoroughly overhauled at cost of \$700. Speed 10-12 miles. Sleep seven. Fully furnished and equipped, ready to go anywhere. Sacrifice \$2500. Worth \$6500. Cash only. Dr. Schefcik, La Salle Bldg., Minneapolis, Minn.

Motor boat hulls, from 12 to 50 ft., all styles, with and without power, at reasonable prices. Good used engines, all types, cheap. We can offer you a good bargain in a complete motor boat or motor only. Tell us what you would like to have and we will quote our lowest price. Atlantic Supply Co., Long Branch, N. J.

#### NEW AND USED AIRPLANE MOTORS

Use an airplane motor  
in your boat

More Power and Speed

Less Gasoline and  
Weight

Airplane Motors, 30 to 300 H.P.  
Lowest Prices

Send for Bulletin "MG"

#### U.S. AERO EXCHANGE

**Trimount  
Whistle Blower Outfits**  
Blower runs by friction  
contact with engine fly-  
wheel. Whistle of brass,  
nickel-plated.

Made in 3 sizes.

**TRIMOUNT ROTARY POWER CO.**

20 Heath Street

(Factory: 292 Whiting Ave., East Dedham, Mass.)

**Trimount  
Rotary Hand Bligs  
Pumps**

All bronze composition.  
Suction lift 4 to  
20 feet. A lifelong  
convenience.

Made in 3 sizes.

**Boston, Mass.**



**FOR SALE**—35 foot, mahogany, Elco express, with practically new 8 cyl. Cadillac motor with electric starter, speed 23 miles per hour. Price \$1500. This outfit is in good condition, and has an unusually complete equipment, including electric lights, auto top, leather cushions, 4 wicker chairs, life preservers, windshield, search light, canvas cover, fenders, flags, etc. R. E. Henry, 27 Pine St., New York City.

**SALE OF U. S. NAVAL VESSELS** (Yachts and Motor Boats).—Sealed proposals will be received at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12 o'clock noon, 15th May, 1919, when they will be publicly opened, for the purchase of the yachts and Motor Boats YO HO, now in the First Naval District; COSSACK, now at Key West, Florida; EDITH M III, now in the Marine Basin, N. Y.; NIGHTINGALE, now at New London, Conn.; and SHIRIN, now at New Orleans, La. Exact location and permission to inspect may be had from the Commandant of the Naval District wherein located. Appraised values: YO HO, \$2,000; COSSACK, \$16,500; EDITH M III, \$6,000; NIGHTINGALE, \$4,000; SHIRIN, \$12,000. The sale will be for cash to the bidder offering the highest price above the appraised value. Forms of proposal and bond, and information concerning the vessels, and the terms and conditions of sale, may be obtained upon application to the bureau of Supplies and Accounts. Josephus Daniels, Secretary of the Navy. 4-3-1919.

**FOR SALE**—A 29 ft. Runabout equipped with a Model 4B 20-35 Sterling motor with electric starter and lights, folding windshield, auto top with curtains, wicker chairs, life preservers, flags, etc. An excellent well-built sea boat with seating capacity for ten, boat and engine cost \$3,000 and is as good as new in every way. Will sacrifice for \$900 cash. J. H. Hagen, Riverhead, L. I., N. Y.

**CANADIANS, Second-hand engine bargains.** Send for list.

**GUARANTEE MOTOR COMPANY**  
73 Bay Street, North Hamilton, Ont., Canada

**WANTED**—Second-hand brass steering gear and stand suitable for yacht 70 ft.

**DAVIS & CHILD**  
1110 14th St., N. W., Washington, D. C.

**USE "SNAPPER" ENGINES** for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

A few medium and high speed, one, two, four and six cylinder, four-cycle marine motors, new or rebuilt. Reliance Motor Boat Co., 210th Street and Harlem River, New York City.

**BOSCH MAGNETOS**—All types \$15.00 each and up.—Coils: Remy-Splittorf—Delco and other types \$5.00. Low Tension Magnets all models \$5.00 each and up. Presto Tanks \$5.00—Lighting Generators \$9.00. Starters. Carburetors. Switches. Steering Wheels, etc. Auto Motors, both water and air cooled all sizes. Write for late bargain bulletin second-hand Auto material suitable for all purposes. Johnston, West End, Pittsburgh, Pa.

Advertising Index will be found on page 112



**FOR SALE**—An extremely seaworthy and reliable cruiser, 50 ft. x 14 ft. x 5 ft. Two cylinder 40 H.P. heavy duty engine. Speed 8 miles per hour. Was originally a heavy canvassed yawl. Captain's state room, large main cabin, sleeps 6 to 8. All white oak construction. Complete with binnacle, lights, galley, toilet, etc. J. Appleton, Port Washington, Wisc.

**WANTED**—Elco or other good modern raised or bridge deck cruiser, 35 to 45 feet. Not over 50 H.P. Preference given to boat near Montreal, Canada. Write giving details, inventory, photograph, lowest cash price, etc. Box C, MoToR BoatingG.

**WANTED**—Small Cruiser, around 26-28 feet. V-bottom preferred. Hunting cabin. Must be staunch and fast and a bargain. Send photo or sketch and full particulars. Will consider offer hull only. J. H. Downing, 16 Middle Street, Portsmouth, Va.

Owner moved to California will sacrifice mahogany runabout. Boat just thoroughly overhauled, ready for launching. Furnished in wicker, excellent engine. Worth \$2000 but will sell for best offer over \$750. See Henry Halsted, Milton Point, Rye, N. Y.

**WANTED**—Bridge deck or raised deck Cruiser Hull. Must be in absolutely perfect condition. With or without engine. Kermath Manufacturing Company, Detroit, Mich.

**FOR SALE**—35-foot Hand V Bottom Cruiser with 50-70 H. P. Brennan motor; practically new. Would consider trading for a smaller boat. C. A. Donovan, 160 Berkeley Street, Lawrence, Mass.

**FOR SALE**—One hundred 8-cylinder motors 3" bore by 4½" stroke. Brand new and block tested. \$100.00 each. New equipment including Atwater-Kent distributor and coil, Stewart carburetor, Dyneto starter and generator \$100.00 extra. Regal Motor Car Co., 216 Piquette Ave., Detroit, Mich.

**WANTED**—Reverse clutch in good order. Min. via shaft 1½ in. 3 Blade Hyde or Columbia. "Ailsa-Craig" L. H. Wheel 24 in. dia. x 20 in. pitch. Give full details. Gordon Baxter, Palmyra, New Jersey.

**FOR SALE** by The Curtiss-Willis Co., 30 Church St., N. Y. 1—72 ft. 35 mile motor boat. New. Cost \$55,000, price \$27,500. 4—240 H.P. Diesel Engines. New. Cost \$31,313, price \$21,000. Also anchors, chain, slip blocks, wire rope, etc. Write us for discounts.

**BARGAINS**—Cabin and open launches, 16 to 35 ft. Prices from \$100 to \$300. 3 H.P. Ferro special, complete equipment. \$35.00. Evinrude outboard motor, built-in magneto, \$45. Write for description, E. W. Bennett, Southampton, New York.

**FOR SALE**—Four complete Make & Brake Ignitors, Rods, and Tripping Latches, with Low Tension Magneto for Standard 32-37 H.P. Marine Engine. Will fit any Standard motor. All \$20.00. P. M. Child, 1110 14th St., N.W., Washington, D. C.

**THIS SIX CYLINDER ENGINE WILL INCREASE SPEED** of your boat. Vibrationless, economical, self-starting, 25 H.P. Immediate Delivery. Special price to introduce. Designers, 54 E. Lafayette Ave., Detroit.

Day Cruiser, "Martha II", 36 ft., 7 ft. 6 in. beam, 110 H.P. six cylinder Van Blerck motor, with starting and lighting outfit, fair haven mooring, tender, cradle, and all other accessories to make up a high class complete gentleman's outfit. Speed, 22 real miles per hour. Collingwood Mills, Third and Cambria Sts., Philadelphia.

High Speed Hulls, mahogany and cedar. Small up-to-the-minute Express and Water cars, suitable for 20 to 100 H.P. at exceptionally low prices. Bronx Boat Works, foot of Willow Ave. bridge, near East 132nd St., New York City.



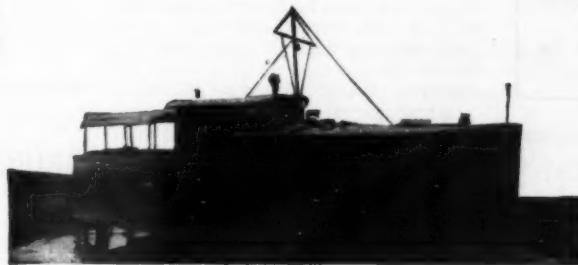
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### Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offer of the month. Please mention MoToR Boating.

FOR SALE—IMMEDIATE DELIVERY.



EMMA BELLE II

Owned by Mr. Harry C. Stutz, Indianapolis. Designed and built by Great Lakes Boat Bldg. Corp.

A 38 Foot Shallow draft (semi-tunnel stern construction) Express Cruiser drawing only 24 inches of water. An ideal boat for Southern Cruising.

This boat, built in July, 1918, has only cruised 500 miles. Is in full commission, ready for immediate delivery. Mr. Stutz is having us build a larger boat, hence his reason for disposing of this one.

This boat is an excellent example of the Great Lakes Modified V-Bottom design, a real sea boat with splendid accommodations for her length. Arrangement consists of:—galley; main cabin with Pullman berths, handsomely upholstered in mohair velvet; completely equipt lavatory; full sized clothes locker; glass enclosed bridge deck; together with a protected after cockpit. Interior finish in mahogany throughout.

#### YOUR OPPORTUNITY TO GET A COMFORTABLE CRUISER NOW!

Wire or write for additional information, blueprints, etc. All enquiries will receive prompt attention.

GREAT LAKES BOAT BUILDING CORPORATION  
MILWAUKEE, WISCONSIN

FOR SALE—18.2 H.P. 3 cyl. 2 cycle Rice engine, complete with clutch, 13 ft. shaft, 20 in. propeller, new A-K ignition. Overhauled, new P rings and bearings. Price \$170. Gordon Baxter, Palmyra, N. J.

SALE OF U. S. NAVAL VESSELS (Motor Boats and Yachts)—Sealed proposals will be received at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12 o'clock noon, May 1, 1919, when they will be publicly opened, for the purchase of the SEA HAWK, now at Key West, Florida; GREY FOX now at the Fifth District; POPE MARY now at Key West, Florida; THETIS now at New London, Conn.; TRAVELER now at Key West, Florida; ZIG ZAG now at Key West, Florida; HOWARDA now at Key West, Florida; VEGA now in the 4th Naval District. Exact location and permission to inspect may be had from the Commandant of the Naval District wherein located. Appraised values: SEA HAWK \$15,000; GREY FOX \$7,000; POPE MARY \$5,000; THETIS \$15,000; TRAVELER \$4,000; ZIG ZAG \$4,000; KANISED \$12,000; GREY HOUND \$3,500; HOWARDA \$9,000 and VEGA \$102,000. The sale will be for cash to the bidder offering the highest price above the appraised value. Forms of proposal and bond, and information concerning the vessels, and the terms and conditions of sale may be obtained upon application to the bureau of Supplies and Accounts. Josephus Daniels, Secretary of the Navy.

FOR SALE—25 ft. runabout, 17 H.P. Ferro motor, Gies reverse Columbian wheel. Anyone wishing such an outfit will do well by looking into this. Full details by mail. Austin D. Parker, 255 Bank St., Bridgeton, N. J.

Motor Boat, first class condition, used about six weeks. Herreshoff built, 46 ft. water line, 9 ft. 3 in. beam, 3 ft. 6 in. draft, oak frame, yellow pine planked and decked. 40 H.P. engine, U. S. Reg. 13 tons. Mahogany deck house 30 ft. Complete equipment, 6 berths. Toilet, pantry, electric lights. Cushions, curtains. Taken in selling estate. Sell cheap. Address Motor Boat, B. Box 274, Portsmouth, N. H.

FOR SALE—Cabin Cruiser about 30 feet long, running water, electric lights, 2 cylinder, 2 cycle engine, 15 H.P., 2 gas tanks, cockpit snugly enclosed with awning, equipped with running lights, anchor, etc. E. P. Eaton, Sag Harbor, New York.

40 H.P. Heavy Duty, 4 cylinder, 6 x 8 Sintz, two cycle marine motor. Complete equipment, reverse gear, bronze shaft and wheel. In running condition and not junk. Weight 2800 lbs. F.O.B. Washington, D. C. \$250.00. Carlisle & Finch, 7 in. brass marine arc pilot house control search lamp, with fly wheel dynamo to suit. \$100.00. A few new small 8 in. 6 volt search lamps, all brass. \$10.00. Davis & Child, 1110 14th St., N. W., Washington, D. C.

CRUISER 44 ft. x 9 ft. 3 in. x 28 in. 30 H.P. Racalco engine 4-cylinder 4 cycle, has not run 500 miles. Full inventory. Beautiful boat, best design and finish. Would cost \$14,000 to replace; will sell for \$2,500. Owner has quit the game. Best bargain on the coast. Write for photo and description. No postals. S. M. Holman, 39 Pleasant St., Attleboro, Mass.

FOR SALE—One 20 H.P. Kermath 1918 engine with new K-W magnetos with impulse starter, overhauled by us and guaranteed for one year the same as a new engine. A splendid bargain at \$315.00. Kermath Mfg. Co., Detroit, Mich.

Marine and automobile engines 1 to 100 H.P. Best makes—good condition—very low prices. State your power needs. We take engines in trade. What have you? Magnetos, coils, carburetors, mechanical oilers, water pumps, etc. Also car parts of every nature—sacrifice prices. Write about your requirements. Badger Motor Company, Milwaukee, Wis.

FOR QUICK DELIVERY, at low prices, high grade, heavy duty, marine crude oil engines of 40, 60, 75, 85, 112 and 150 B. H. P. Recent changes in owner's plans makes these engines available. Jacobson Engineering Co., 5 Second Ave., Rensselaer, N. Y.

MOTOR boat, 26 x 7, hunting cabin, fully equipped, toilet. Bedell's, Glenwood, L. I.

FOR SALE—Bull Dog Reverse Gear. Patterns, jigs, fixtures, stock of parts and all rights. Agents throughout U. S. & Canada. Can be had cheap. Write Atlas Machine Works, 797 St. Aubin Ave., Detroit, Michigan.

ENGINES—When buying a rebuilt engine get the best. United engines are rebuilt. Every engine fitted with new set famous Inland Gas-tight piston rings. Engines thoroughly tested and Guaranteed one year. Let us quote you before buying. Write, United Motor Repair & Supply Company, 305-309 Broadway, N. Y.

WANTED—Good second-hand motor boat, 20 feet long, auto top and control, four cylinder, reverse gear, speed about 15 miles per hour. Address with photo, price and description. H. D. Wright, Gloversville, New York.

FOR SALE—Bargain—Six cylinder, 40-60 H.P. Pierce Budd speed engine, or might trade for medium duty engine. Ernest Merrow, Hyde Park, Mass.

Highest offer before May 1st takes 43 ft. x 9 1/2 ft. cabin motor cruiser Jeannette, now at Portland Yacht Yard, Middletown, Conn., 24 H.P. 4 cyl., 4 cycle Palmer engine, sleeps six, large galley and toilet, electric lights. Complete cruising equipment. Address Wallace E. Mason, Normal School, Keene, N. H. See boat at Middletown, Conn., at any time. Advertised price last year \$1600. Now, first check for \$1100 or highest offer before May 1st.

#### GUARANTEED REBUILT ENGINES.

Sterling, 4-cylinder, 20-35 H.P.  
 Buffalo, 2-cylinder, 3-4 H.P.  
 Sterling, model FM, 6-cylinder, 85-125 H.P.  
 Murray & Tregurtha, 4-cylinder, 40 H.P.  
 Van Blerck, 8-cylinder, 115 H.P.  
 Fay & Bowen, 3-cylinder, 17 H.P.  
 Bridgeport, 2-cylinder, 15 H.P.  
 Speedway, 6-cylinder, 60-75 H.P.  
 Gray, 1-cylinder, 6 H.P.  
 All of above engines rebuilt and guaranteed in good running order. Send for our large list of rebuilt engines. Walter H. Moreton, 214 State St., Boston, Mass.

When writing to advertisers please mention MoToR Boating, the National Magazine of Motor Boating

## NAVAL ARCHITECTS & YACHT BROKERS

**Thomas D. Bowes, M. E.**  
NAVAL ARCHITECT AND ENGINEER

Offices:

Lafayette Bldg., Chestnut and Fifth Sts.  
PHILADELPHIA, PA.

**The W. H. Chapman Co.**  
Middletown, Conn.

Medium size brass  
and bronze castings  
Established 1875

**COX & STEVENS**  
Engineers and Naval Architects  
Yacht Brokers

16 WILLIAM STREET, NEW YORK CITY  
TELEPHONE 1375 BROAD

**THE EDWARDS ENGINEERING CO.**  
NAVAL ARCHITECTS & ENGINEERS  
DESIGNERS OF  
OIL ENGINE YACHTS  
AND  
COMMERCIAL VESSELS  
18 SO. 7TH ST. PHILADELPHIA, PA.

**ELLIOTT GARDNER**  
NAVAL ARCHITECT  
184 South Street, Stamford, Conn.  
UP TO DATE DESIGNS

Complete plans, Instructions and Patterns. Latest and most efficient designs in Fast V Bottom Runabouts and Cruisers. Racing Cruisers and Auxiliaries. Hydroplanes. Yacht Tenders and Row Boats. State type of boat wanted and write for Blue Prints. Latest thing out for Amateur Builders. A 26 foot V Bottom runabout especially designed to give best results with a Ford Auto Engine. Speed, 16 to 20 M.P.H.

**William H. Hand, Jr.**  
NAVAL ARCHITECT  
NEW BEDFORD, MASS.  
HAND-V-BOTTOM DESIGNS  
Write for 48-page illustrated catalog

**FREDERICK K. LORD**  
NAVAL ARCHITECT  
120 BROADWAY NEW YORK

**FREDERICK S. NOCK**  
Naval Architect and Yacht Builder  
Marine Railways, Storage, Repairs  
East Greenwich Rhode Island

## To Use Your Boat

(Continued from page 9)

rolled, licensed or documented in the Customshouses, (b) public vessels, (c) vessels less than 16 feet in length, temporarily equipped with detachable motors.

A registered boat is one supposed to do business in a foreign country, while enrolled and licensed boats are those which do business only in the United States. Licensed boats are of not more than 20 tons burden while all motor boats of more than 16 tons gross burden are documented and therefore exempt, and do not have to be numbered.

In the case of vessels having power tenders, the tenders will carry the same number as the parent boat and the cards will describe only the parent boat, stating the number of power tenders. In the case of documented boats having power tenders, the tenders will be described in a separate number given to each.

In case a motor boat is lost or destroyed or there is a change of ownership, notice of such must be furnished within ten days by the owners to the Collector of Customs and the districts where their numbers were awarded.

Although the present bill has been in operation only since December 7, 1918, and during a period when it is not to be expected that more than a small percentage of the existing boat owners would have made application for the numbers for their craft, owing to the fact that their boats were out of commission (although the law does not distinguish between a craft out of commission and one in commission), yet during the first ten weeks nearly 50,000 motor boats have been numbered. The chart on page 8 shows graphically the distribution of the boats numbered up to the middle of February. While it will be noted that there are several states in the central portion of the country where no boats have been numbered, yet it does not follow that there are no motor boats in these states. Numbers are required only on boats navigating the Federal waterways of the country. No numbers are required on boats navigating the waters under the jurisdiction of the State Governments, which explains the reason for no boats being numbered in a few of the inland states.

The war tax on motor boats is another point which is apt to cause the motor boatmen some worry, although if it is remembered that the new tax rate is just double the one of last year, no confusion should result.

The tax year begins on July 1 and ends on the following June 30. The new tax rate, that is, double the old rate, took effect on April 1, 1919, leaving the months of April, May and June in the present tax year. This means that the tax for three months, or one-quarter of the yearly rate, is due at the present time which must be paid before the boat is used. However, as most motor boatmen whose boats were in commission last season, have already paid their tax up to June 30, 1919, yet

(Continued on page 64)

Advertising Index will be found on page 112

**HARRY W. SANFORD**  
YACHT BROKER

501 FIFTH AVE., at 42nd St., N. Y.

Desirable yachts of all types for sale and charter  
Telephone 909 Vanderbilt

**TAMS, LEMOINE & CRANE**

Yacht and Ship Brokers  
Naval Architects  
Marine Engineers

52 Pine Street

New York

**BRUNS, KIMBALL & CO., Inc.**  
153-5-9 West 15th St., New York City

Offer over 200 re-built engines, backed by a strict guarantee, at especially attractive prices. List will be sent free for the asking. Your present engine will be taken in part payment for a new Sterling, Kermath, Gray-Prior, Doman, Missouri, Universal, 4 cycle; Eagle, Harford and Arrow, 2 cycle; Missouri heavy oil engines, simple and economical. Burnoil, heavy duty 4 cycle heavy oil engines, quick starting, economical, easy to operate. Write for offer.

**The Chemical Fire Chiefs Recommend**  
**Fire-Choke**

Thrown from the hand it instantly extinguishes incipient fires. Two sizes, \$3.50 and \$5.00. Send for free sample.

**THE FLEXLUME SIGN CO.**

1441-45 Niagara St., Buffalo, N. Y.

**Gear Pulling Made Easy**



Says the Master Mechanic. The Greb Automatic Grip Puller is a One-Man Puller—Quick-acting, strong and simple in the extreme. May be locked in any desired position. A combination of two or three arms. Heavy Duty Size capacity 1" to 18"—Junior size capacity 1/2" to 7". Two sets of jaws furnished with each size.

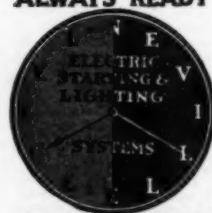
**Ten Days' Trial** If your dealer or jobber does not have them we will send you one. Try it ten days. If not satisfactory, return to us and we will refund your money. We also make the Greb Rim Tool.

THE GREB CO., 225 State Street, BOSTON

**-LEECE-**  
**ELECTRIC**  
**STARTING-LIGHTING**  
**SYSTEM**  
**NEVILLE**

OUTFITS OF QUALITY

**AUTOMOBILES** **ALWAYS READY** **MOTOR BOATS**



DAY OR NIGHT

MANUFACTURED BY

**THE LEECE-NEVILLE COMPANY**  
CLEVELAND, OHIO

# Sea Sleds After the War

*The war has done for the sea sled, what it has done for the airplane—carried through a development which otherwise would have been impossible within the line.*

THE sea sled to-day is recognized as the only successful high speed motor boat for naval service.

The sea sled is the only safe and successful high speed boat for any service.

The sea sled is the only boat capable of running with speed unaffected in shoal water and through the heaviest weed growths.

*In future all inquiries will be dealt with by:—*

**The SEA SLED COMPANY**

Boston, Mass.

BOEING AIRPLANE CO.

Seattle, Wash.

VIPER CO., LTD.

Picton, Nova Scotia, Canada





# Graphic Navigation

(Continued from page 21)

## ELEVENTH STEP

Get the Azimuths of both stars.  
Enter Azimuth Tables Number 71, with the assumed Lat. and the Hour Angle and Dec.  
Subtract the Hour Angle from 24 if necessary to bring it within the limits of the table. Thus:

t ★ Hamal.....	24 <sup>h</sup> 00 <sup>m</sup>
	20 <sup>h</sup> 15 <sup>m</sup>
Equals t with which to enter table.....	3 <sup>h</sup> 45 <sup>m</sup>

Find by mental interpolation between Lat. 40° and 41° N. and the p.m. time between 3<sup>h</sup> 40<sup>m</sup> and 3<sup>h</sup> 50<sup>m</sup>, for a Dec. of + 23°.

The Star Hamal bore east. This checks the approximate Azimuth found, — N. 92½° E.

Enter table with t of Star Altair, 2<sup>h</sup> 30<sup>m</sup>, and Dec. + 8°.

Use same process of mental interpolation (in this case for Lat. only) and find Azimuth to be approximately N. 124° W.; this checks with the bearing N.W. by W.

It is not necessary to plot Azimuths closer than to the nearest half degree.

## TWELFTH STEP

Plot the position on a chart.

From the Assumed Position lay off the lines of Azimuth and draw the positions lines perpendicular to them as indicated by the Altitude Difference.

The intersection of the lines of position will be the true position.

In this case the True Position is discovered to be Lat. 40° 1' 40" N. and Long. 69° 21' 50" W.

See Fig. 39.

## FORM COMPLETE

Date, Nov. 10, 1918, p.m.  
Lat. by D.R. 40° 30' N.  
Long. by D.R. 69° 25' W.  
C — W, 5<sup>h</sup> 25<sup>m</sup> 15<sup>s</sup>  
C.C. — 5<sup>s</sup>  
Height of eye, 42 feet.  
I.C., 0.

W.T. ....	6 <sup>h</sup> 12 <sup>m</sup> 10 <sup>s</sup>	Obs. Alt. ★ Hamal.....	40° 4' 50"
C — W .....	5 <sup>h</sup> 25 <sup>m</sup> 15 <sup>s</sup>	Corr. ....	— 7' 30"
Cro. t .....	11 <sup>h</sup> 37 <sup>m</sup> 25 <sup>s</sup>	Obs. h.....	39° 57' 20"
C.C. ....	— 5 <sup>s</sup>		
G.M.T. ....	11 <sup>h</sup> 37 <sup>m</sup> 20 <sup>s</sup>	R.A.M.S. for G.M.N.....	15 <sup>h</sup> 15 <sup>m</sup> 20 <sup>s</sup> .1
R.A.M.S. at G.M.T.....	15 <sup>h</sup> 17 <sup>m</sup> 15 <sup>s</sup>	Corr. ....	+ 1 <sup>m</sup> 54 <sup>s</sup> .5
G.S.T. ....	26 <sup>h</sup> 54 <sup>m</sup> 35 <sup>s</sup>	R.A.M.S. for G.M.T.....	15 <sup>h</sup> 17 <sup>m</sup> 14 <sup>s</sup> .6
λ W .....	4 <sup>h</sup> 37 <sup>m</sup> 40 <sup>s</sup>	or.....	15 <sup>h</sup> 17 <sup>m</sup> 15 <sup>s</sup>
L.S.T. ....	22 <sup>h</sup> 16 <sup>m</sup> 55 <sup>s</sup>		
R.A. ★ Hamal.....	2 <sup>h</sup> 2 <sup>m</sup> 38 <sup>s</sup>		
t .....	20 <sup>h</sup> 14 <sup>m</sup> 17 <sup>s</sup>	Log. Hav. ....	9.34931
Lat. 40° 30' N. ....		Log. Cos. ....	9.88105
Dec. + 23° 4' 54" .....		Log. Cos. ....	9.96376

Lat. ~ Dec. 17° 25' 6"

Log. Hav. θ	9.19412
Nat. Hav. θ	.15635
Nat. Hav. ....	.02292
Nat. Hav. z	.17927 = 90° 0'
Cal. h .....	39° 54' 00"
Obs. h .....	39° 57' 20"
Alt. Diff.....	3' 20" Go to.

W.T. ....	6 <sup>h</sup> 14 <sup>m</sup> 22 <sup>s</sup>	Obs. Alt. ★ Altair.....	43° 57' 10"
C — W .....	5 <sup>h</sup> 25 <sup>m</sup> 15 <sup>s</sup>	Corr. ....	— 7' 21"
Cro. t .....	11 <sup>h</sup> 39 <sup>m</sup> 37 <sup>s</sup>	Obs. h .....	43° 49' 49"
C.C. ....	— 5 <sup>s</sup>		
G.M.T. ....	11 <sup>h</sup> 39 <sup>m</sup> 32 <sup>s</sup>	Z Hamal .....	N. 92°.5
R.A.M.S. at G.M.T.....	15 <sup>h</sup> 17 <sup>m</sup> 15 <sup>s</sup>	Z Altair .....	N. 124° W.
G.S.T. ....	26 <sup>h</sup> 56 <sup>m</sup> 47 <sup>s</sup>		
λ W .....	4 <sup>h</sup> 37 <sup>m</sup> 40 <sup>s</sup>		
L.S.T. ....	22 <sup>h</sup> 19 <sup>m</sup> 7 <sup>s</sup>		
R.A. ★ Altair.....	19 <sup>h</sup> 46 <sup>m</sup> 50 <sup>s</sup>		
t .....	2 <sup>h</sup> 32 <sup>m</sup> 17 <sup>s</sup>	Log. Hav. ....	9.02684
Lat. 40° 30' N. ....		Log. Cos. ....	9.88105
Dec. + 8° 39' 24" .....		Log. Cos. ....	9.99502

Lat. ~ Dec. 31° 50' 36"

Log. Hav. θ	8.90291
Nat. Hav. θ	.07997
Nat. Hav. ....	.07526
Nat. Hav. z	.15523 = 90° 00' 00"
Cal. h .....	43° 35' 37"
Obs. h .....	43° 49' 49"
Alt. Diff.....	14' 12" Go to.

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*"The Utmost in Cigarettes"*  
 Plain End or Cork Tip  
 People of culture and refinement  
 invariably **PREFER** Deities  
 to any other cigarette.

*Anargyros*

Makers of the Highest Grade Turkish  
 and Egyptian Cigarettes in the World

30¢

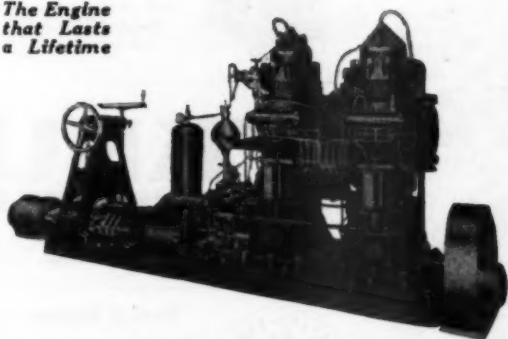
# GULOWSEN "GREI" OIL ENGINE

## Power Plant Perfection for the Work Boat



**THE** Gulowsen "Grei" Engine is the oldest crude oil engine on the market to-day, having been built for the last sixteen years. Under normal conditions it consumes ½ pint of crude oil or less per H. P. per hour.

*The Engine  
 that Lasts  
 a Lifetime*



No carburetor or valves. Centrifugal governor acts directly on fuel pumps. Ignition is by cast iron hot bulbs in each cylinder. The engine can be started from stone cold within 30 seconds by means of our new improved electric hot plug. This hot plug will last a lifetime, but can be replaced as easily as a spark plug.

The Gulowsen "Grei" is remarkable because of its unusual flexibility—something rarely found in a heavy duty plant. In equipping your work boat with this motor you will overcome all heavy duty problems.

4 to 100 B. H. P. ready for immediate delivery from Seattle or New York. Reasonable deliveries on larger sizes up to 360 B. H. P. Engines of 130 H. P. up are started and reversed by compressed air.

Write today for catalog.

**Gulowsen Sales Corporation, 17 State St., New York**

*When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating*

## To Use Your Boat

(Continued from page 60)

this was figured at the old rate which amount already paid will naturally be credited to the owner in the payment of his tax at the new rate for the period from April 1, 1919, to June 30, 1919. This credit will amount to just half the tax due for this three months' period, for example, on a boat of less than five net tons burden on which the old tax had been paid, the new tax due will be \$1.25. (\$2.50 — \$1.25 = \$1.25.)

The table on page 94 shows the different tax rates on the different sizes of boats.

It will be remembered that tonnage is found by multiplying the length of the boat in feet by its breadth multiplied by its depth (from deck to top of keel) and multiplied by six-tenths. This product divided by 100 gives the gross tonnage. To determine net tonnage deduct from the above mentioned gross tonnage the following:

The spaces appropriated to the use of the crew and master, including sleeping and living quarters, galley, toilet and wash rooms, space occupied by anchor gear, storage of sails, charts, signals and other instruments of navigation and boatswains' stores, provided they are reasonable in extent, used solely for the purposes designated.

In addition to the above deduct the propelling power space. When the propelling machinery is located in the cabin or a compartment that is used for other purposes, the machinery space, the basis for propelling power allowance, is to be considered the space occupied by the engine and sufficient space on each side for handling it safely and efficiently, otherwise allow whatever space there is. Fuel tanks and bunkers, storage batteries, or other engine accessories are not to be included in the machinery space.

The terms master and crew apply only to those employed in the navigation and care of the vessel; the owner, if not sailing master, and guests are to be considered passengers.

### PORTS WHERE NUMBERS ARE ISSUED AND LETTERS ALLOTTED TO CUSTOMS DISTRICTS.

Port	Letters Assigned	Port	Letters Assigned
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Bridgeport, Conn.	HJ	Des Moines, Ia.	H
New York, N. Y.	K	Omaha, Neb.	Y
Philadelphia, Pa.	LM	St. Paul, Minn.	Z
Baltimore, Md.	NP	Pembina, N. D.	I
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Wilmington, N. C.	T	Cleveland, Ohio.	N
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St. Albans, Vt.	X	Duluth, Minn.	U
Ogdensburg, N. Y.	Y	Los Angeles, Cal.	A
Rochester, N. Y.	Q	San Francisco, Cal.	
Buffalo, N. Y.	Q		BCDEF
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San Antonio, Tex.	F	Honolulu, Hawaii	XY
Memphis, Tenn.	M	Juneau, Alaska	TU
Louisville, Ky.	L		

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(Continued on page 94)

Advertising Index will be found on page 112



TRADE MARK  
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Deliver 30%  
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Get the details of our 18-foot V Special 2 1/2 H. P. ready to run. Price \$250. Plans of other sizes on request.

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UNIVERSAL JOINTS**  
Absolutely Dependable  
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**ENJOY  
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of the  
WAVES**  
K D or  
Complete  
**RICHARDSON BOAT CO.** No. Tonawanda, N. Y.

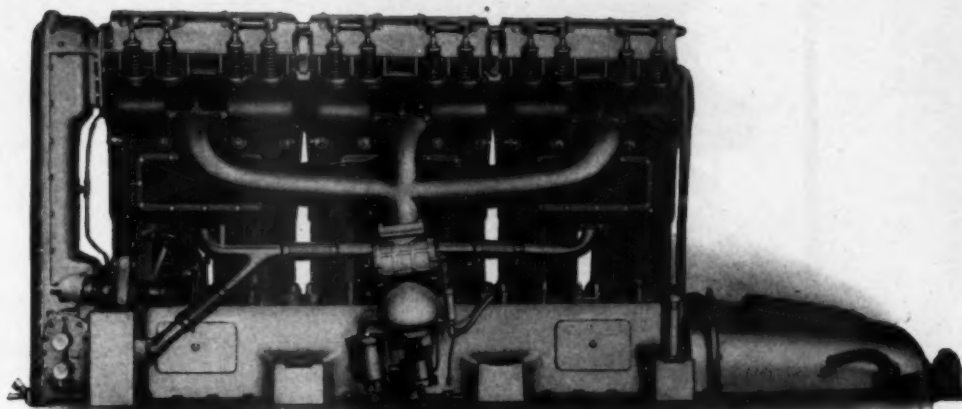
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WORTH MORE DOES MORE

**TUNGAR  
BATTERY CHARGING**  
Give longer life to storage batteries.  
Three Sizes: for clubs and private boathouses.  
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POLISH**  
WILL MAKE YOUR BOAT JUST LIKE NEW

**Nautical Instruments**  
underlighted Compasses  
Course Protractors, Beating  
Finders. Every navigator  
should have them. Send for  
interesting catalogue. Address  
Box 46,  
**Marine Compass Company.**  
Bryantville, Mass.





# Announcement

A change in  
organization

The Murray & Tregurtha Corporation, of Atlantic, Mass., has been formed to develop the growing business of the well-known Murray & Tregurtha Company, which has been building high-grade marine engines and yachts for the past thirty years.

The personnel of the former organization has been strengthened materially by acquiring some of the best talent in the marine engine field.

Plans and  
Products

The new organization has eliminated the yacht building department of the old company; the entire facilities will be used in producing in large quantities the well-known Murray & Tregurtha Marine Engines, in both the high speed and heavy duty types.

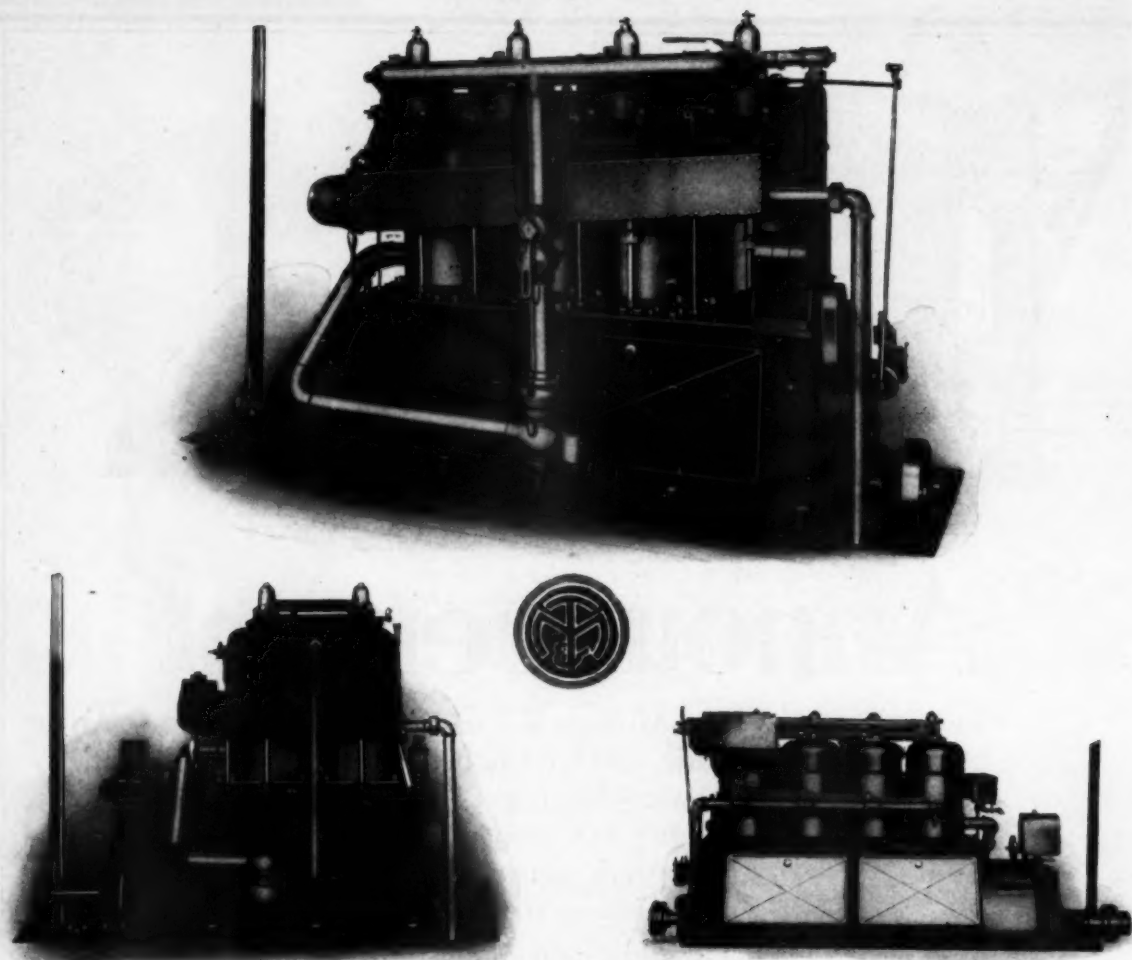
We have an attractive proposition to offer boat builders and naval architects. Let us tell you about it.

## Murray & Tregurtha Corp.

Atlantic,



Mass.



## Murray & Tregurtha Heavy Duty Marine Engines

We will continue to build the following sizes of the *old reliable* Murray & Tregurtha Heavy Duty Marine Engines.

We list below the principal specifications of these motors which are in production—it takes our complete catalog to even partially describe their many good features.

Model E-2, 2 cyl, Bore 6½, Stroke 8,	18 H.P. at 425 R.P.M....	\$1000.00 F.O.B. Factory
" E-3, 3 cyl, Bore 6½, Stroke 8,	28 H.P. at 425 R.P.M....	\$1600.00 F.O.B. Factory
" E-4, 4 cyl, Bore 6½, Stroke 8,	40 H.P. at 450 R.P.M....	\$2200.00 F.O.B. Factory
" E-6, 6 cyl, Bore 6½, Stroke 8,	60 H.P. at 450 R.P.M....	\$3250.00 F.O.B. Factory
" F-4, 4 cyl, Bore 7½, Stroke 10,	60 H.P. at 375 R.P.M....	\$3000.00 F.O.B. Factory
" F-6, 6 cyl, Bore 7½, Stroke 10,	100 H.P. at 450 R.P.M....	\$4500.00 F.O.B. Factory

Definite standardization of manufacturing methods has enabled us to produce the above engines in large quantities and to incorporate in the manufacture of these engines the best of materials obtainable and the highest grade of workmanship.

## Murray & Tregurtha Corp. Atlantic, Mass.



## The SENSIBLE Safety Suit

The only ventilated and sanitary Safety Suit on the market. Winter or Summer, in the water, on land or high in the air,—it gives warmth and comfort with perfect protection against drowning or exposure. And you cannot become too warm, literally bathed in perspiration, as with all other air-tight and water-tight safety suits.

The Sensible Safety Suit permits the utmost freedom of movement and is therefore most practical for navigators, aviators, hunters, duck shooters, fishermen, and others. No lead weights in feet or legs. The life preservers can be quickly removed. Entire suit donned in less than a minute.

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# MATTHEWS CRAFT



*"Quality without Extravagance"*

**The Matthews Boat Co.**

MARINE RAILWAYS  
STORAGE BASIN  
and WORKS

**Port Clinton, O.**



## FINISHED CRANK SHAFTS

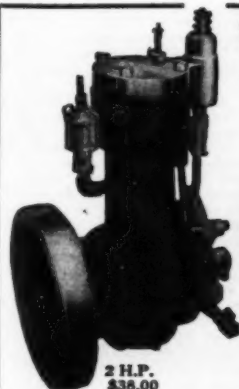
**P. H. GILL & SONS FORGE AND  
MACHINE WORKS, BROOKLYN, N. Y.**

We are furnishing them to some of the leading marine engine builders. Carbon and Alloy Steel. Heat Treated to your own specifications. We grind all Pins and Bearings. Forged, machined, and finished complete in our own plant. Let us quote you.

## MoToR BoatinG

*The Marine Industry's Greatest Magazine*

First in interest and authority, first in circulation  
and first in advertising value.



2 H.P.  
\$38.00



Cut of 3 cyl.  
6 & 12 H.P.  
Motors



The Dunn Factory

### Dunn 4-Cycle Marine Motors 1919 Models—Kerosene, Gasoline

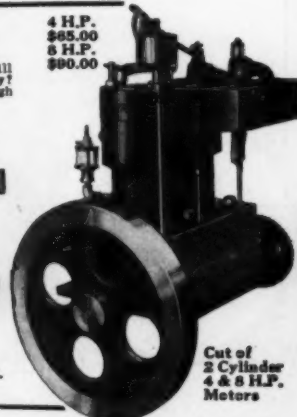
The demand for "Dunn" Motors during 1919 will be even bigger than it has been this past year. Why? Because we are selling a line of 4 cycle engines of high grade, at honest prices to you. Our motors are strong, economical, reliable and durable. It will pay you to get a Dunn. Write for our free catalogue, or better still, order to-day.

**DUNN MOTOR  
WORKS**

Ogdensburg,  
New York, U.S.A.



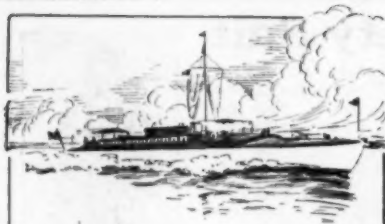
4 cyl. 16 H.P.  
\$150.00



Cut of  
2 Cylinder  
4 & 8 H.P.  
Motors

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THE INSTRUMENT OF QUALITY  
**Sonora**  
CLEAR AS A BELL

## Portable

**A**BOARD the yacht or trim cruiser music is most acceptable to pass the time away. When the conversation lags, the Sonora Portable offers you a source of unalloyed pleasure instantly available.

If you wish to dance, there is no need for elaborate preparations. At the seashore or at the country place, the Sonora Portable is ready as soon as eager hands take up the rugs and lay bare the smooth hardwood floor.

You need this remarkable phonograph, which is of typical Sonora quality.

The case of the Sonora Portable is of the finest calfskin, leather-lined, provided with well made spring locks. The trimmings are nickel plated and the weight is only 15 pounds complete.

The dimensions are 10¾ inches long, 10¾ inches wide and 10½ inches high. A strong leather handle is provided. The motor is of the "double spring" type.

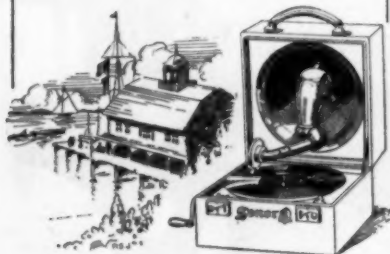
The Sonora Portable, like every other Sonora model, is guaranteed and plays perfectly all makes of disc records, all sizes.

**Price \$60**

A complete line of upright and period models is available at prices from \$30 to \$1000. Write for catalog No. 18

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George E. Brighton, President  
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Dealers Everywhere



## Why Should I Own a Motor Boat?

(Continued from page 12)

flesh ever could be doctored up. All lines of merchandising unfortunately have pilferers of this stripe and the motor boat industry is not immune. There are many good boats and motors put up for sale second-hand that are reliable in every way but unfortunately the age of a boat or even of a motor is not a reliable index of its present worth. A good boat will give many years service and look well if given proper care and this applies with equal truth to the well-built marine motor. But both may be only a few years old but having been carelessly used are wracked beyond repair and very naturally the pleasures of motor boating cannot be well enjoyed in boats of this kind. And whatever type of boat you may wish to own, either new or second-hand, it will be always well worth while to purchase from a reliable company, unless, of course, you happen to know the craft and the owner who wishes to dispose of it. There are so many dependable men in the motor boat field that it is easy to buy just the boat you want at a fair price, and such a craft will prove a sound investment, and motors and all accessories can be likewise purchased to the same good advantage. If you happen to want advice, write to the Service Department of MoToR Boating, but do not buy a boat or motor on a mere gamble.

There are no Fords as yet in the motor boating field but there is a good variety of small and inexpensive craft to choose from and no matter what your specifications may call for, I am pretty confident you will find a boat to fully measure up to your ideas without difficulty. There is as wide a range in model, finish, power and price in motor craft as you will find in motor cars. If you happen to want a plainly finished boat with a reliable medium-power motor, you can select a boat from one of several designs and you will get all boat value at the price you elect to pay. Not so many years ago it was difficult to buy a cruiser or any but the one stock model, unless to special order, which meant an increased price to pay for designing a boat to your order. Today practically all of the larger boat builders carry stock boats in a large variety of designs, lengths and finishes and as many builders specialize in various types of boats—speed craft, cruisers, runabouts, etc., the motor boat market affords a very complete line of standardized boats, ranging in length from the sixteen-footer all the way up to the fifty- or sixty-foot cruiser. If you want a plainly finished boat of one of several different types with either a medium-powered motor or a high-speed power plant, you can buy it ready to run and delivered promptly. And if your ideas call for a mahogany planked hydroplane for either racing or runabout use you can quickly have it, and a luxurious cruiser of the express or of the deep-sea type and all other designs, from

(Continued on page 70)

Advertising Index will be found on page 112

## MARVELITE

Made with Radium

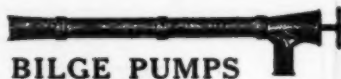
makes clock and instrument dials glow in the dark. Instrument manufacturers will furnish them Marvelited if you ask them.  
COLD LIGHT MANUFACTURING COMPANY,  
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Brooklyn Varnish Mfg. Co.

Waterproof Spar Varnish  
For all OUT-  
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Guaranteed.

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Copper or Galvanized Steel—2 to 4 inch diameter—any length. Also Sectional Pumps with removable valve.

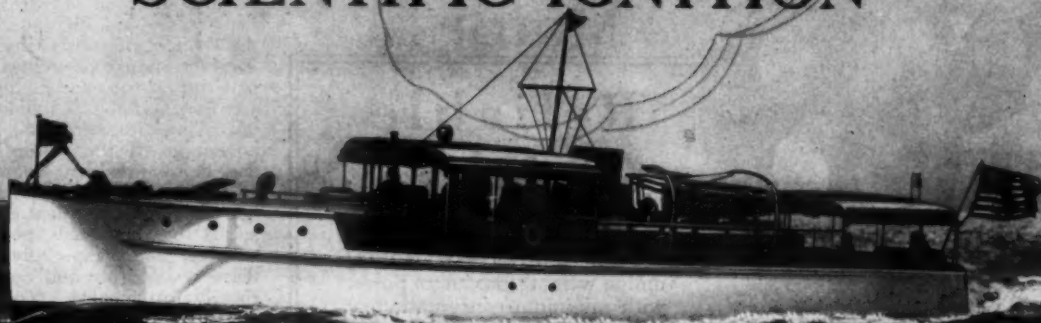
Write for prices. Discounts to dealers.

BLUE & QUERPEL CO., 230 Third Ave., New York City

Statement of the Ownership, Management, Circulation, etc., required by the Act of Congress of August 24, 1912, of MoToR Boating, published monthly at New York, N. Y., for April 1, 1919. State of New York, County of New York, ss. Before me, a Notary Public, in and for the State and county aforesaid, personally appeared C. F. Chapman, who, having been duly sworn according to law, deposes and says that he is the Business Manager of MoToR Boating, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, to wit: 1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, International Magazine Company, 119 West 40th St., New York, N. Y.; Editor, C. F. Chapman, 119 West 40th St., New York, N. Y.; Managing Editor, C. F. Chapman, 119 West 40th St., New York, N. Y.; Business Manager, C. F. Chapman, 119 West 40th St., New York, N. Y. 2. That the owners are: International Magazine Company, 119 West 40th St., New York, N. Y.; Stockholders, W. R. Hearst, 137 Riverside Drive, New York, N. Y.; M. V. Hearst, 137 Riverside Drive, New York, N. Y. 3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: Columbia Trust Company, 60 Broadway, New York, N. Y.; M. V. Hearst, 137 Riverside Drive, New York, N. Y.; W. R. Hearst, 137 Riverside Drive, New York, N. Y.; Arthur Brisbane, 238 William St., New York, N. Y.; Lina Strauss, 27 West 72nd Street, New York, N. Y.; George J. Gould, 165 Broadway, New York, N. Y.; E. H. Gary, 856 Fifth Avenue, New York, N. Y.; Samuel Untermyer, 37 Wall Street, New York, N. Y.; George W. Perkins, 71 Broadway, New York, N. Y.; James Speyer, 1038 Fifth Avenue, New York, N. Y. 4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. C. F. Chapman, Business Manager. Sworn to and subscribed before me this 31st day of March, 1919. (Seal) Thorolf O. Machel, Notary Public, Kings County. (My commission expires March 30, 1921.)

# ATWATER KENT

## SCIENTIFIC IGNITION



### Express Cruiser "Kumagin" Atwater Kent Equipped

This 76-foot Express Cruiser built by the Great Lakes Boat Building Corporation for Mr. Albert Pack of East Chicago has a model "J" Van Blerck Engine, Atwater Kent Equipped.

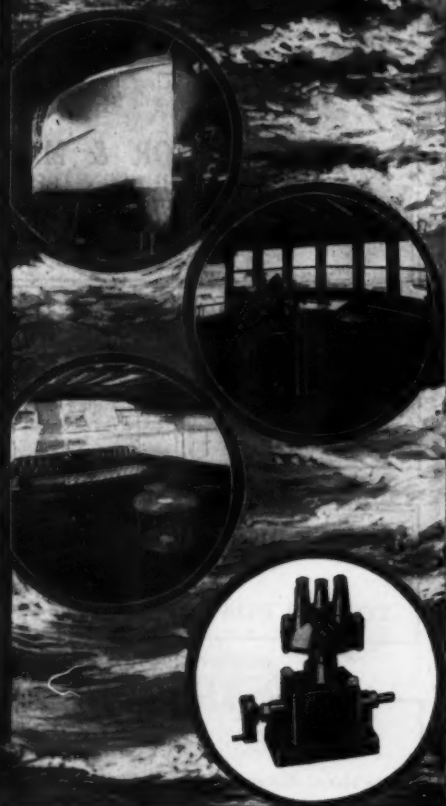
**It is significant that on quality built boats Atwater Kent is usually the chosen form of ignition.**

Its big hot spark improves marine motor operation, insures easy starting in all weathers, maximum power at all speeds, and saves gasoline.

Our Type H System will operate efficiently on marine motors, either from dry batteries (a season's operation from a set of six) a separate storage battery or a storage battery generator charged.

**Will Replace any Magneto on any Motor and do Better Work.**

**ATWATER KENT MFG. WORKS**  
*Philadelphia*



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# ARROW

## Light Weight Inboard Motors

### Reliable and Efficient

Sturdy construction without undue weight; maximum power with minimum consumption of

gas; these are two of the important features found in the famous Arrow-Waterman Model K's.

These little engines, built in either one or two cylinder types, are just the thing for tenders or other small boats where space and weight limitations are confronted. The Arrow-Waterman light weight inboard motor is being used by many boatmen whose problems include a lack of space for the power plant.

The Model K-2, for instance, weighs only 60 lbs., and may be installed in an ordinary rowboat without any preparation by anyone who is handy with tools. The lack of vibration will surprise you—notwithstanding the fact that this model develops 5 h.p. Built in our own factory it comes to you with a guarantee as to the quality of material and workmanship put into it. A reliable 2 cylinder engine equipped with aluminum crankcase and copper water jacket.

The single cylinder model (K-1) is a 2½ h.p. motor weighing only 36 lbs., that performs consistently day in and out. It is especially suitable for installation in canoes and very small rowboats.

Arrow-Waterman Motors offer you every desirable feature in small boat power plants. They may be seen at any time at our factory or a descriptive catalogue will be sent upon request.

**ARROW MOTOR & MACHINE COMPANY, Inc.**

632 HUDSON TERMINAL BUILDING

NEW YORK CITY

NEW YORK

Foreign Office, 47 Broadway, N. Y. C.

J. E. Sitterley, Foreign Sales Mgr.

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MoToR BoatinG's classified advertising columns are a great market place for the buyer and seller of used motor boats, engines and accessories.

Advertisements for these columns must be received by tenth of month preceding issue, with remittance at the rates quoted at the top of the Market Place pages.

If you have a boat or engine for sale, let the Market Place help you to dispose of it promptly.

## TOPPAN BOATS

POWER DORIES, GOV. MODEL LAUNCHES, ROWING  
AND SAILING DORIES AND SKIFFS.

Write for full information and prices.

TOPPAN BOAT MFG. CO.

Medford, Mass., Dept. M.

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Four Cycle Light Weight Engines

Five sizes—Single cylinder 3½ H.P., 4 H.P., 7 H.P. Two cylinder 7 H.P., 8 H.P.  
Send for Catalogue. Live Agents wanted.

CHANDLER-DUNLAP CO. Polson Bldg. SEATTLE, U. S. A.

Advertising Index will be found on page 112

### Why Should I Own a Motor Boat?

(Continued from page 68)

the little dory up the scale to the completely furnished cruiser can be as readily purchased.

Buying a boat is easy and somewhat difficult, depending entirely upon whether you happen to know the good points of hull and motor or have yet to learn their good features. The particular use for which you want to use the craft is, of course, the chief factor for there is a type of boat which will best serve you under the conditions you have in mind. To choose any other boat than this is to fail to take full advantage of the motor boat market and enjoy the great sport under less favorable conditions than you are required to. A good boat especially well suited for your needs, powered with a reliable motor especially designed to drive it smoothly and economically, is the logical choice. You can enjoy motor boating with a less perfectly balanced outfit than this, but as there is no reason why you should do so, a little careful discrimination while purchasing will result in owning a fine outfit for the sport and you will find the fullest measure of satisfaction without experiencing trouble of any kind.

The best boat for your particular use is to a large extent a personal decision, because personal opinion enters to decide not only how much you want to pay but what finish you shall choose. The design or model best adapted for your needs may be considered to a certain extent also a personal question, insofar as there are many variations of the general type. However, boats are bought much as motor cars are purchased by picking the best type for your purpose. And boats are conveniently divided into several prominent classes with many variations of design in each class. For fast traveling there is the racing or speed type which may be subdivided into the regular hull and the hydroplane form with one or more steps. In the cruising type there are likewise many forms of designs; the fast high-powered express cruiser type and the medium- and low-speed boats for inland or sheltered waters and deeper boats with more beam for rough water and deep-sea cruising. The runabout class is replete with the greatest variety of designs, because it is the most popular and all-around motor boat. In this class are found many designs for fast traveling, medium-speed boats and the low-speed craft powered with a single cylinder motor. And the best advice I know of to the purchaser of a boat is to first become reasonably well posted on the many good designs offered by our representative builders and when the boat type is decided upon, buy the best boat you can afford of its class. A good boat, like all other merchandise, is always sold at a fair price. You can purchase a piano for little more than a hundred dollars but not a first class one for this amount. It is the same with motor cars and with motor boats.

(Continued on page 72)





50-foot Cruiser

## Boats That Express Individuality

These six standardized models of Albany Craft are the result of building boats that have given satisfaction to a distinguished clientele of prominent yachtsmen—and the United States Government.

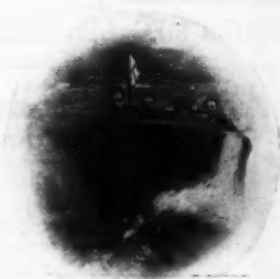
These standard types, as well as our custom work, are finished to express client's individuality.

Interesting descriptive brochures are prepared for each model.

**Albany Boat Corporation**  
Watervliet, N.Y.



26-foot Runabout



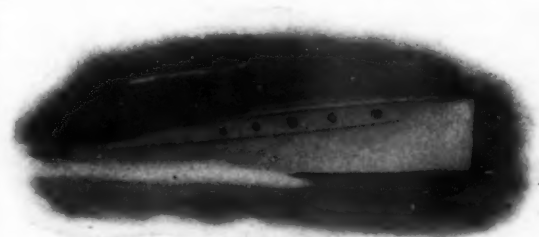
35-foot Express Runabout



30-foot Fast Runabout



40-foot Day Cruiser



36-foot Cruiser

*When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating*

**A FREE BOOK ON CATCHING BIG FISH**

Boys get this book. It gives simplified instructions on how to cast—how to catch and land the big ones.

**THE DAYS OF REAL SPORT**

In addition—tells a live, red blooded story. Illustrated by cartoonist Briggs. FREE Send today.

**SOUTH BEND BAIT CO.**  
29287 COLFAX AVE.,  
SOUTH BEND, IND.



**A**VOID disaster by using a DIRIGO compass on that boat. All materials first class. No rubber gaskets to rot. A very hard pivot and high-grade jewel. Vary degree circle on dial. Brass and mahogany binnacle. Also new course finder and bearings instrument. Send for descriptive catalog.

**EUGENE M. SHERMAN**  
Box 3 Bellevue, Wash.



### SAVE GASOLINE

Get More Power. Greater Speed. Smoother Operation. Longer Service. New Stromberg Carburetor for Marine Engines "does it."

Write—Give motor specifications, name boat and engine, number of cylinders, bore and stroke.

**STROMBERG MOTOR DEVICES CO.,**  
Dept. 544  
64 E. 25th St., Chicago, Ill.

**SCHLEBLER**  
**CARBURETOR**  
Standard of the World  
Consistent Winner of Motor Boat Races  
The Wheeler-Schlebler Carburetor Co., Inc.,  
Indianapolis, U. S. A.



**You Can Build Your Own Boat**  
and save 2/3 the cost by the **BROOKS K. D. SYSTEM.**  
Send for catalogue showing all models.

**BROOKS MFG. CO.,** SAGINAW, MICH.  
1191 RUST AVE.



**Anderson Engines**  
**Are Good Engines**  
(ask any owner)  
4 to 100 H. P.  
Write for description and prices.  
**ANDERSON ENGINE CO.**  
4632 N. Rockwell St., Chicago.

### Sandusky Dinks

"The famous Davis Dink to be known from now on as the Sandusky Dink"  
The Ideal Tender



For many years the famous "Davis Dink" has been accepted by the boating world as the ideal tender for any boat. Owners of the finest yachts afloat have been among the first to specify "Davis Dinks" when approving plans and specifications.

From now on the "Davis Dink" is to be known as the "Sandusky Dink." The change is in name only—the quality of material and excellence of design will remain the same.

"Sandusky Dinks" are light, strong and serviceable. Both row and power are continually in stock in sizes from 8 to 16 feet. Send for catalog today.

**Sandusky Boat & Cabinet Works, Sandusky, Ohio**

## To Manufacture Marine Motors By Up To Date Production Methods

(Continued from page 44)

the best versed men in the marine engine and yachting field and needs no further introduction. Many hundreds of motor boatmen are already personally acquainted with Mr. Murray as his supervision of the business of the old company put him into contact with every owner of a Murray & Tregurtha motor. Mr. Murray took great pride in this personal service as he called it and that there is not one dissatisfied M. & T. owner to be found today is the result of the combination of a high grade marine motor and a president who cared.

Otis C. Funderburk, the first vice-president and chief engineer of the new organization, is recognized as one of the leading engineers on internal combustion engines. Mr. Funderburk is a graduate mechanical engineer and has spent the last twenty years in the designing and building of high-speed gas engines and has also made very exhaustive experiments on carburetion specialties. In carburetors alone, he has been granted fifty-four United States patents and his designs and improvements are used on all the best known carburetors. Mr. Funderburk has complete charge of all engineering and production for the new organization.

Frank B. Sexton, the second vice-president in charge of sales, service, and advertising for the new corporation, is well-known in the marine engine field, having occupied a similar position with the Van Blerck Motor Company for a number of years. Mr. Sexton has been engaged in the manufacturing and selling end of the marine engine business for over twenty years and for this reason is well fitted to take hold of the company's plans for expanding its business.


Linus C. Coggan, the secretary and treasurer of the new organization, is a very well-known New England attorney. Mr. Coggan has been the attorney for the Murray & Tregurtha Company for a number of years and succeeded to the position of treasurer and counsel on the death of the former treasurer, Mr. William Tregurtha, in the early part of 1917.

## Why Should I Own a Motor Boat?

(Continued from page 70)

the best will cost you more. For a certain amount you can own a well constructed and correctly designed hull and install a dependable motor, and you cannot purchase a good boat for less than this. This will give you all boat value for your money, and if you want a finer finished craft you can pay as much as you like for mahogany or teak or elaborate decorations. You will have a more beautiful craft but the boat will neither be more comfortable nor speedy because of its finer finish.

**BRUSH EFFICIENCY**



**WHITING-ADAMS BRUSHES**  
**PAINTING EFFICIENCY DEPENDS ON THE BRUSH**  
Three factors make for high-grade painting—PAINT, PAINTER AND BRUSH  
Whiting-Adams  
TRADE VULCAN MARK  
Rubber Cemented  
**BRUSHES**  
Bristles fastened with Vulcanized Hard Rubber, and held in a vice-like grip. Shedding of bristles and failure of brushes impossible. Guaranteed in every respect. The most extensive and best line of brushes in the world. Send for illustrated literature  
**JOHN L. WHITING-J. J. ADAMS CO.**  
690 to 710 Harrison Ave., Boston, U. S. A.  
Brush Manufacturer for Over 108 Years and the Largest in the World

**ELECTRICAL HEATING AND COOKING DEVICES**  
FOR Motor Yachts  
Motor Yacht Builders

Flat Irons, Toasters, Grills, Toaster Stoves, Curling Irons, Heaters, Soldering Irons, Air Heaters, Glue Pots, Etc.

American Electrical Heater Co.  
Detroit, U. S. A.  
Write for Illustrated List, Prices and Descriptions. Oldest and Largest Exclusive Makers. Established 1884.

Wittmann-Lewis Aircraft Company  
**Flying Boats & Airplanes**  
Newark, New Jersey

## WICKER-KRAFT YACHT FURNITURE

Used on the finest boats. Regularly supplied by highest grade boat builders. Wicker-Kraft Chairs fitted with life belts, are an original Wicker-Kraft idea. Write for illustrated catalog.

**WICKER-KRAFT CO.,** Newburgh, N. Y.

## POLARINE

The Standard Oil For All Motors

Standard Oil Co. of New York

**REVERSE GEARS**  
RADIATE SATISFACTION  
Five Models Write for Free Circular  
**GIES GEAR COMPANY**  
47 First Street East, Detroit, Mich.



## COLUMBIA YACHT WHITE



### Goes on White Stays White

Columbia Yacht White is a *permanent* white for topsides, deckhouses and finest yacht work. It is one marine finish that will defy salt water and hard knocks through the entire season. No mid-season painting is needed. And next year its smooth, clean surface may be re-finished without burning or scraping.

**VERNOSITE**, the long life spar varnish, will not turn white or lose its gloss under sun, rain, snow or from the action of salt water.

**DEVOE DECK PAINT** is made to withstand hard usage. All surfaces under foot should be protected with this long-wearing weather-proof paint.

**HEAT RESISTING ENAMEL** gives a high, oil-proof, heat-proof gloss finish to marine engines that keeps them clean and rust-proof.

*At paint, hardware and ship supply dealers*

## DEVOE

The oldest paint manufacturing concern in the United States. Founded in New York in 1754

**DEVOE & RAYNOLDS CO., Inc.**  
New York Chicago

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*Universal*

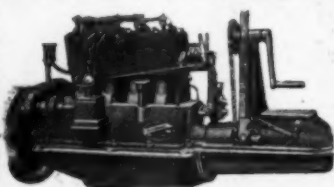


### Dreams That Will Come True

First thing you know the Boating Season will be here.

Make your Dreams of Enjoyment Come True by installing the

#### MODEL "C" UNIVERSAL



9-12 H.P. 4 Cylinder 4 Cycle  
300 to 1000 R.P.M.

The Leading Small Motor for Every Type of Craft up to 30 ft.

Twenty years of experience in a region of lakes and rivers literally swarming with motor boats of all kinds and sizes impressed upon us the fact that at least 80% of all boats in use could be served by one size of motor which would make it possible to standardize manufacturing methods and perfect one design and size with the resultant benefit to the buyer.

1500 Sold to U. S. Gov't for War Use  
Send for Bulletin No. 29

UNIVERSAL MOTOR CO.

OSHKOSH, WIS.

### Quayle Oil Engines

FOR MARINE SERVICE

COMMONWEALTH MOTORS CO.

16 W. Madison St. Dept. E-1 Chicago, Ill.

### Forgings and Castings

for marine work a specialty. Our experience in this particular field is at your disposal. Get our estimates before specifying on aluminum, bronze and composition castings, also drop forgings of steel and brass.

THE HARLEY COMPANY  
Highland Station Springfield, Mass.

### IMPROVED THERMEX SILENCER

Increases Revolutions, No Back Pressure!

Cannot clog, nor collect salt; water cannot flow back to cylinder. No heating, no odor. Used hot or under water—adjustable discharge. Lightest, cheapest to install. Free booklet shows why. Send for it today.

CENTRAL MFG. CO.,  
155 Liverpool St. East Boston, Mass.

### Safety Suits That Really Save At Sea

(Continued from page 36)

"The buoyancy consists of thirty-four ounces of prime Japara Kapok, divided into three sections; one in front containing twenty ounces, one at the back containing eleven ounces, and one about the head and neck containing three ounces. The latter is arranged to close about the face with draw-strings in such a manner as to make the suit absolutely water-tight.

"The suit can be ventilated at any time the wearer desires as the entire head may be uncovered and the suit left open at the neck by the draw-string adjustment.

"This suit can be put on in less than a minute, and is intended to be used as an emergency suit, and as such will float any person either in an upright position or lying on his back. The buoyancy is so placed and co-ordinated with the weights in the feet that if the wearer should become inert his body would immediately turn face up and remain in a semi-upright position, the Kapok at the back of the neck and head holding the head high out of water.

"The balance between the weights and Kapok is such that any person can stand upright or lie down at will, thus insuring the maximum of comfort if a person is obliged to spend hours in the water. It is also possible to swim in this suit almost as rapidly as in a bathing suit, which would enable one to get away from a sinking ship and avoid being drawn under with the suction or entangled among floating wreckage.

"As this suit is air- and water-tight, it will keep the wearer dry and warm. The fabric is practically a non-conductor, therefore all bodily heat is kept within the suit and the wearer suffers no serious discomfort even though in icy water for hours.

"The head is fully protected by a hood and secures the same bodily heat as the rest of the body. In case of the wind blowing up an icy spray this is very important. The hood is also well surrounded with soft Kapok and the neck muscles may be perfectly relaxed when the wearer lies down and he could go to sleep with safety.

"In effect, the suit is a bag closing with a draw-string, the adjustments of which are very simple. It has but one opening, which is at the top, no valves nor springs to get out of order; no metal parts to rust, bend or break.

"While intended primarily to be used as a life saving suit in the generally accepted use of that term, it is soft and pliable and can be worn at any time as protection against the cold, rain and inclement weather, and as it is constructed of very durable material it will stand the maximum of wear and still be safe as a life preserver should an emergency arise. The soles would probably outwear the average sole of a rubber boot."

#### THE SENSIBLE SAFETY SUIT

SIMPLICITY is the chief characteristic of this suit, according to its inventor, who says:

(Continued on page 76)

Advertising Index will be found on page 112

Simple in Construction **SIMPLE-EZY** Easy in Action

GALVANIZED PRESSURE

### PUMP

A GALVANIZED FORCE PUMP WITH THE ADVANTAGES OF AN EXPENSIVE BRASS PUMP.

For

Boatmen  
Fishermen  
Contractors  
Plumbers  
and  
many  
others

Made in the following sizes:

Size	Capacity	Price
1 1/2"x24	2 Qts.	\$2.75 ea.
2"x24	3 Qts.	\$3.00 ea.
3"x24	4 1/2 Qts.	\$3.25 ea.
2"x36	6 Qts.	\$3.50 ea.
3"x36	9 Qts.	\$3.75 ea.

Satisfaction Guaranteed.

The "SIMPLE-EZY" Pump is indispensable where the transfer of liquids is necessary. Made from Heavy Gauge Galvanized Iron. Has a tapered spout for hose attachment and four times the capacity of the ordinary pump. It can be used for spraying trees, plants, etc. One operation will convince you of its merit.

Your Dealer or

BURROUGHS TOOL CO., Inc., Mfrs.  
87 Warren Street New York City, U. S. A.

### BURGER BOATS

COMMERCIAL AND PLEASURE

If you plan to build a new boat this spring it will pay you to get our prices. We are prepared to furnish any boat up to 300 feet for all purposes and we guarantee satisfaction.

Write for information

BURGER BOAT CO. Wiscasin  
Manitowoc,

### If You Want

to know anything about boats or boating, about the marine market or the marine industry, write the editors of MoToR BoatinG for information.

MoToR BoatinG is the leading magazine of the marine field—leading in circulation as well as in authority and interest. It exists for the service it can render to boat owners and to members of this industry. Let it be of service to you.

### MoToR BoatinG

119 W. 40th St. New York

## The A. P. B. A. GOLD CHALLENGE CUP

was captured in 1918 by "Miss Detroit III", making a record of five consecutive years that this famous trophy has been won by boats equipped with

# Hyde Turbine Type Propellers

### *The Record:*

1914—Baby Speed Demon II  
1915—Miss Detroit  
1916—Miss Minneapolis  
1917—Miss Detroit II  
1918—Miss Detroit III

Isn't this record a convincing proof of the remarkable efficiency of Hyde Propellers?



Miss Detroit III—Winner Gold Challenge Cup, 1918

To start the year 1919 right, Hyde-equipped boats swept the field at the Miami Regatta. "Hoosier IV" won the Open Displacement Races and also established a New A. P. B. A. Official Record for boats of her class. "Whip" captured the Miami Cruiser Championship. Both of the boats use HYDE wheels.

Hyde Turbine Type Propellers are not designed for speed work alone as is proven by the numerous installations on heavy craft of all descriptions. We are in position to furnish a propeller to secure the utmost efficiency on any kind of engine and any type of hull.

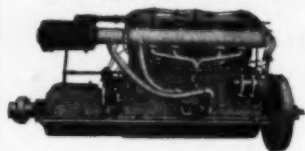
Write for catalogue and data sheet.

## Hyde Windlass Company

Bath, Maine, U. S. A.

## Regal Marine Engines

Have 18 years successful building behind them



The line is very complete, sizes ranging from 2 H.P. to 50 H.P. The engines can be equipped with any kind of ignition desired and are constructed to burn gasoline, kerosene or distillate.

Write for catalog and prices.

### REGAL GASOLINE ENGINE COMPANY

74 Pearl Street  
COLDWATER - MICHIGAN

## INTEGRAL CAMSHAFTS

We make them for the leading builders of marine, airplane and automobile motors. We are Integral Camshaft Specialists, insuring the utmost in quality of workmanship and materials, accuracy and uniformity.

Let us quote on your designs.

MUSKEGON MOTOR SPECIALTIES CO.  
Muskegon, Mich.

## PALMER ENGINES

If the demands you make of a power plant are of more than usual severity it will pay you to investigate the qualities that prevail in the Palmer. Built for any duty under any conditions, the Palmer Engine powers many of America's best boats.

PALMER BROTHERS

Cos Cob Connecticut

## PUMPS

Made by the  
Lipman Mfg. Co.

for circulating purposes are the very best. Hundreds of Thousands in use. Send for Catalogue.

233 Pleasant St. Beloit, Wis.

## The Standard Reverse Gear

is now giving supreme satisfaction on more than 20,000 motor boats, large and small. It is a strong, quiet, clean, trouble-proof gear that runs in oil, takes little space and lasts as long as the boat itself.

New Catalogue and prices on application.

Langry Machine & Tool Co.  
700 Commonwealth Avenue  
DETROIT, MICH.



4 Sizes  
1 to 15 H.P.  
per 150  
H.P.M.

## Safety Suits That Really Save At Sea

(Continued from page 74)

"It is simply a water-proof, rubberized, strong double fabric garment onto which is attached a life preserver. It is put on over the clothing and covers the body with the exception of the hands, feet and head. At the lower or ankle fastening an absorbent cotton felt pad is incorporated to insure, if one is long in cold water, that capillarity, that subtle but powerful force of nature, will surely effect the slow admission of moisture or water which, being unconsciously warmed by the wearer as it is slowly soaked up by the clothing, protects his body from the cold water of the ocean.

"It is open down the front to the crotch like a union suit. Inside of this opening in the body of the suit is a water-tight bellows which automatically closes itself water-tight at the top when folded into place. The two edges of the opening itself are closed their entire length with one pull of a string by the well known 'Hookless Fastener.' No water, therefore, can enter from the ankles to the neck. The neck is adjustable and made tight as to wind, spray and waves but designedly is not air-tight.

"The life preserver is made of large but thin Kapok pads which conform comfortably to the shape of the body from the hips to the neck and are buttoned into ventilated weather-proof compartments on the outside of the suit. They are therefore readily removed when desired.

"The United States has already granted over 200 patents on life saving garments, yet every other life saving suit devised has had the fundamental aim and object of being absolutely water-tight and of keeping the body and clothing perfectly dry, thereby giving the inventors of the patents under which the Sensible Safety Suit is made a clear field in the use of water for conserving the body heat. Why this was, it is hard to say when all the scientific world has known for generations that water is the best attainable substance for storing heat. One cubic inch of water in the clothing holds over 3,400 times as much heat as the cubic inch of air it displaces. In addition to its superior heat storing capacity water is one of the best known non-conductors of heat.

"The weight of the whole suit, including the life preserver, is less than nine pounds. No counterweights are used in it, and having no iron frame it is easily packed into small space. It is furnished in a neat, strong canvas bag.

"While Kapok, the material now universally used for life preservers, will not, if immersed in water, become saturated for many days, yet it will absorb perspiration and very soon become foul and offensive.

"This condition is practically certain to obtain where the Kapok is enclosed within a life saving suit. So far as I know, the Sensible Safety Suit is the only life saving suit that is free from this very serious objection."

Advertising Index will be found on page 112

## Baldrige Reverse Gear

has every good feature that any other good reverse gear has—and then some.

The BALDRIDGE is a clean gear. Its perfect enclosure keeps all grime in the gear where it belongs.

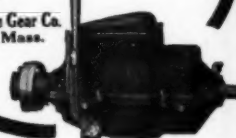
THE BALDRIDGE will work for you a long, long time. Salt water cannot get in and rust out its parts. THE BALDRIDGE unbroken mainshaft absolutely prevents your gear

from sagging and getting out of alignment. Immediate deliveries are now possible if you act quick.

Send for booklet, "For the Man in the Boat"—Free.

The Baldrige Gear Co.  
Boston, Mass.

The reverse speed is 66% of the forward speed.



## KEYLESS RADIUM DIAL CLOCKS

The ideal clock for every motor boat, cruiser and yacht. The Radium Dial makes the hands and numerals visible at night.

Adopted by the U. S. Navy for Airplanes. Price \$15.00. Other clocks from \$2.50 to \$4.00.

Write for details and prices.

Keyless Auto Clock Co., 248 West 59th St., New York City.



"Airdrive"

Model L-3 3 H.P. for canoes, rowboats, fishing and hunting boats.

Model M-3 10 H.P. for light commercial use, and pleasure boats.

Model O-4 24 H.P. for work boats up to 20 ton capacity.

An "Airdrive" on your boat will decrease your power troubles, give you more satisfaction, and at low operating expense. Let one prove it for you on your boat.

KEMP MACHINE WORKS  
1217 So. Franklin Street,  
Muncie, Ind.

## WE CAN MAKE PROMPT DELIVERY OF NEARLY ALL SIZES OF THE FAMOUS EMERSON 2 CYCLE 4 PORT

AT THE OLD PRICE

HERFURTH ENGINE & MACHINERY CO.  
Alexandria, Va.

## E. J. WILLIS CO.

Don't wait until you are in urgent need of some supplies or hardware for your boat. Write today for our illustrated catalog, study it carefully, compare the prices with what you have to pay elsewhere and then send us your order for what you need. We will ship it promptly from our large and complete stock, and save you both time and money.

No matter what you want in the marine line, if it is sold anywhere in New York City we will get it for you and ship it the same day your order is received. Give us a trial.

Write today for Catalog "B"  
Send anywhere free on request.

85 Chambers Street, N. Y. City





## DELCO-LIGHT MARINE SET

Make your motor boat trips at night a real pleasure.

The DELCO-LIGHT MARINE SET assures electric light and power just when and where you need it.

The cabin or sleeping quarters may be electric lighted; also well ventilated by electric fans.

Even hot lunches may be prepared aboard by chafing dish and percolator.

Motor boat engines may be easily cared for with the aid of a portable electric light.

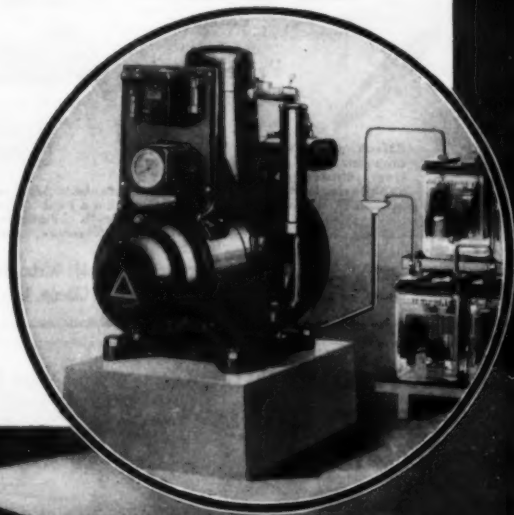
*A complete electric light and power plant for Motor Boats, House Boats and Summer Cottages.*

*Self-cranking — air-cooled — ball and roller bearings — no belts — only one place to oil — thick plate, long lived battery.*

### RUNS ON KEROSENE

THE DOMESTIC ENGINEERING COMPANY

Makers of DELCO-LIGHT Products  
DAYTON, OHIO, U. S. A.



## BOAT LETTERS AND NUMBERS

Cast brass 3" boat letters and numbers in above style to comply with Government license specifications, each letter drilled and furnished with screws ready to fasten on boat.

	Per letter Hyphen			Per letter Hyphen	
Rough brass...	\$0.25	\$0.05	Silver plate...	\$0.45	\$0.15
Polished brass..	.30	.07	Gold plate....	.75	.20
Nickel plate....	.35	.10			

Add one cent per letter for Parcel Post.

**H421** The W. H. Chapman Co.  
Founded 1875 Middletown, Conn.

## "DAYTON" Four-Light and Ignition System (24 Candle Power) 6 volts



Write for Bulletin No. 65  
**THE DAYTON ELECTRICAL MFG. CO.**  
Dayton, Ohio, U. S. A.

## Built by LUDERS

*The Last Word in Yacht Designing  
and Building*

**Luders Marine  
Construction Company**

Stamford, Conn.



**MOTOR BOATS**  
18, 18, 20 and 24 ft.  
Without engine, \$45 and up  
With engine, \$150 and up



**DETACHABLE  
MOTOR BOATS**  
Standard Model....\$45  
Lake Model.....50  
Fish boat (shallow water).....25



**ROWBOATS**  
Double Enders, \$30 and up  
Square Stern, \$35 and up



Speed Canoes....\$25 and up  
Detachable Motor, 55 and up  
Paddling Canoes.. 27 and up

**CATALOG FREE**—Prices Based On Selling Direct to User—Order By Mail. Please state what kind of boat you are interested in, we can meet your requirements in PRICE, QUALITY and DELIVERY.

**THOMPSON BROS. BOAT MFG. CO.,** 1910 Ellis Ave., Pashtigo, Wis.

**Kaizer**  
Patented

Self-Locking  
STEERERS

Best  
Steerers  
Lowest  
Cost  
All Types  
In Stock



Price, \$40  
Complete



Effect great economy in use. Positive control—no back lash. Installed in DISTURBER IV

We also manufacture All Cast Bronze Concealed Wire Searchlight with Patented Control. Rope Steerers. Marine Fittings

**GEO. B. CARPENTER & CO.** 440 Wells Street  
Chicago, U.S.A.

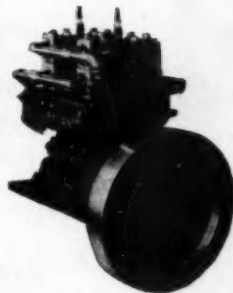
## Its The Perfected Superior

Its the greatest advance of a decade in design.

Its mechanically operated intake valve makes it the equal of four-cycle motors in economy, reliability and flexibility, and its remarkably sturdy construction gives it even more than the average two-cycles ability for hard work.

It's built with 1, 2, 3 and 4 cylinders. 6 to 24 H.P.  
Find out about it.

**Superior Motor Works**  
Jackson, Mich.



## America's Finest Motor Boats



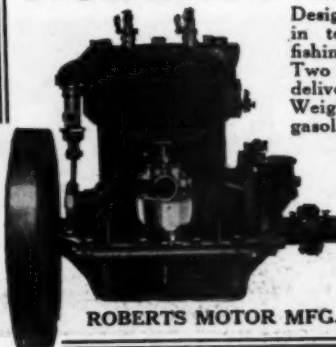
Whatever you want—Runabout, Speed Boat, Cruiser, Rowboat or Canoe.

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Figure 1464

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Fig. 1392

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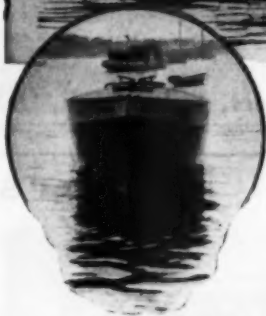
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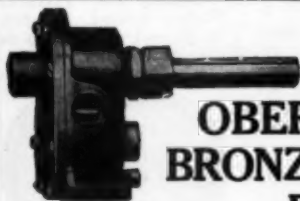
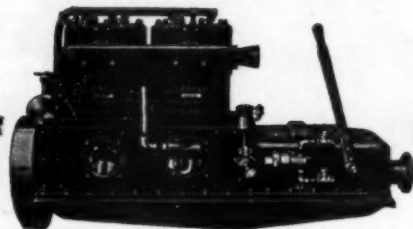
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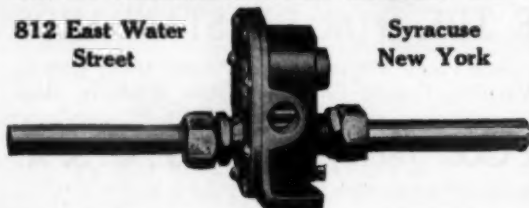
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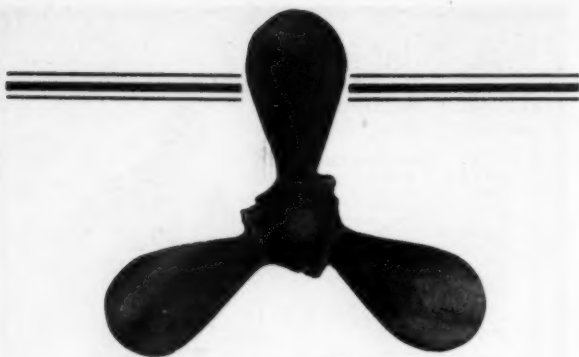
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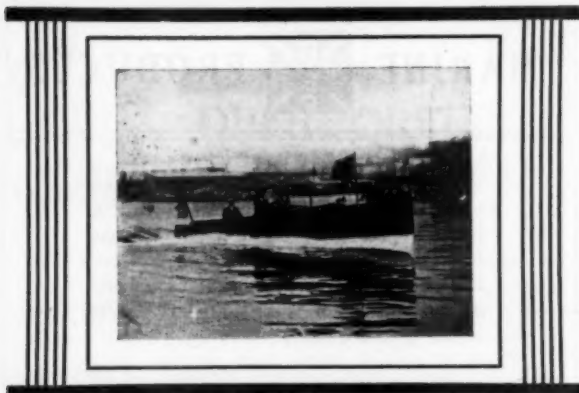
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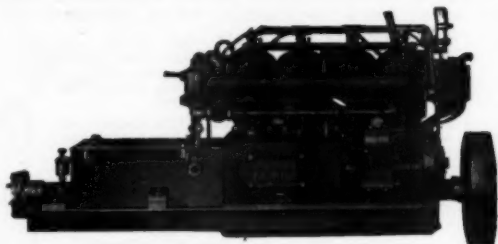
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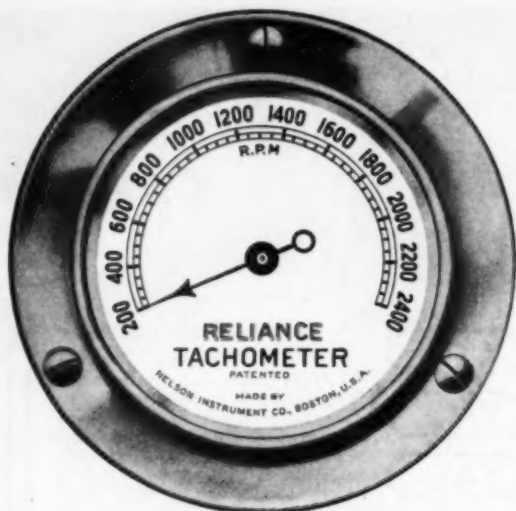
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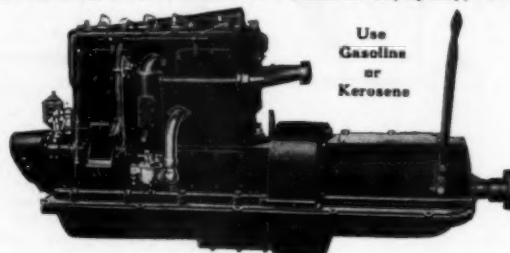
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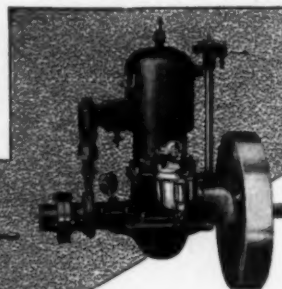


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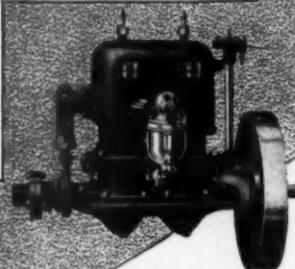
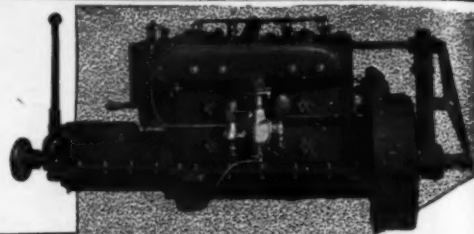
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**RED WING MOTOR COMPANY, Dept. B., Red Wing, Minn., U. S. A.**

## Mathis-Built Houseboats



**70-ft. LANAI**

built by us and sold in 1911 through Messrs. Tams, Lemoine & Crane to Ex-Com. A. C. James, of the New York Yacht Club. A boat that proved its sturdiness on its maiden trip south, despite ice floes and storms at sea.

built for service—for comfort—for economy of operation.

That they achieve all these ends, without question, is shown by the fact that they are the choice of such men "who know," as A. P. Ordway, Murray Guggenheim, H. N. Baruch, George W. Perkins, Arthur Curtis James, W. J. Matheson, Henry W. Savage and others.

When your plans for that new cruiser or houseboat are ready, it will pay to get the Mathis estimate.

## Mathis Yacht Building Co.

Specialists in Houseboats and Cruisers from 40 to 120 ft.

COOPER'S POINT

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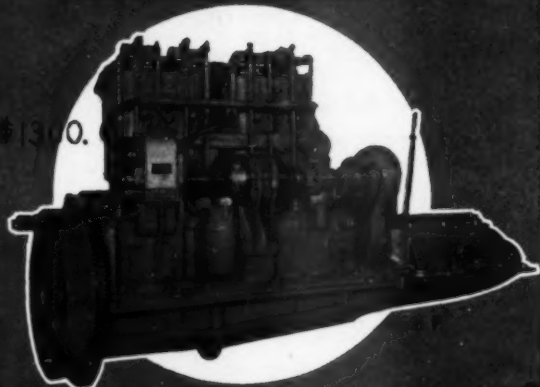
CAMDEN, N. J.



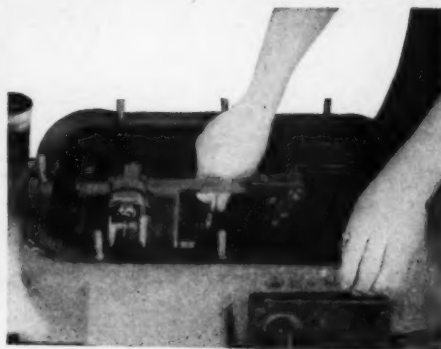


**MOTORS**

A better motor for cruisers, work boats and runabouts. A source of unfailing power, regardless of severe demands or adverse conditions.



**KNOX MOTORS ASSOCIATES**  
Springfield Mass



The cut above shows the reverse gear housing cover removed, and the high speed being locked into its proper adjustment. Note the very large hand hole allowing ample space entirely around the gear so that all parts of it may be readily inspected and adjustments made if necessary. This is a feature which is found in few motors outside of the Knox.

## ANNOUNCING HACKER-1919-DESIGNS AT POPULAR PRICES

**HOOSIER IV**  
Winner of Southern Displacement  
Championship. Holder of official  
A. P. B. A. Record



If you are going to build your own boat, why not build it from Hacker up-to-the-minute Stock plans, which we are now offering you. John L. Hacker, N. A. America's foremost designer of Speedy and efficient V bottom boats, has just completed a number of new plans, based on boats which have been built, tested and proved by Mr. Hacker, powered with various standard power plant and fully guaranteed. These plans are especially simplified, and contain such detailed instruction that the average amateur mechanic will not find any difficulty in building a successful boat from them. Write for booklet, stating which boat you are interested in. The following plans are ready for delivery.

Sea Wolf type, 18, 21, 25 and 30 footers.  
Special Speed type, 16, 21 and 26 footers.  
Hoosier type, 26, 28, 30, 32 and 35 footers.

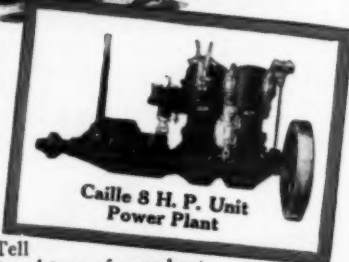
Special Designs to Order

**JOHN L. HACKER BOAT COMPANY**  
325-327 Crane Avenue Detroit, Mich.



## We Have Just The Motor For Your Boat

Among the many types of Caille Perfection Motors ranging in sizes from  $2\frac{1}{2}$  to 30 H.P., there's a motor that would just fit your boat. Caille motors are built in standard and heavy duty types, one to four cylinders, with or without electric starters, bulkhead control and electric lights. Tell us the length, beam, draft and type of your boat. We'll tell you the type and price of motor to power it. Ask for special catalog.



**CAILLE 5 Speed Motor**

Attaches to any rowboat. Has five speeds—two forward, a neutral and two reverse. It is equipped with a starter—no cranking. Has magneto in flywheel. Positively the highest-developed rowboat motor made. Ask for our 5-Speed Motor Catalog.

## Liberty Drive ROWBOAT MOTOR

is always on its good behavior in weeds and shallows. They never bother it. It pivots on the stern of boat. Raises or lowers by pressing on steering handle. Steers by swinging propeller to right or left. Propeller rises over stones, sunken logs, etc. The Liberty Drive Motor will propel a boat anywhere it will float. You can run it right up on the beach. Has speed of five to ten miles per hour. Weighs about seventy pounds. Send for details.

Only  
**\$58.00**



**The Caille Perfection  
Motor Company**  
45 Caille Bldg. Detroit,  
Mich.

# CAILLE

On Marine Motors Is a Hallmark of Quality

## Graphic Navigation

(Continued from page 62)

Get the angular difference between the Right Ascension and the Local Sidereal Time, that is, subtract the less from the greater, the remainder will be the Hour Angle (t). Thus,  
L.S.T. first sight.....  $22^h 16^m 55^s$   
R.A. ★ Hamal.....  $2^h 2^m 38^s$  rejecting the .1<sup>s</sup>.

t .....  $20^h 14^m 17^s$

Declination ★ Hamel, +  $23^\circ 4' 54''$ .

L.S.T. second sight.....  $22^h 19^m 7^s$

R.A. ★ Altair.....  $19^h 46^m 50^s$  calling  $49^\circ.8, 50^\circ$ .

t .....  $2^h 32^m 17^s$

Declination ★ Altair +  $8^\circ 39' 24''$ .

See Fig. 34.

### EIGHTH STEP

Having all parts, proceed to computation. Use the Cosine Haversine formula. See Saint Hilaire method in last issue.

t ★ Hamal,  $20^h 14^m 17^s$ ..... Log. Hav. 9.34931  
Lat. of assumed position,  $40^\circ 30' N$ ..... Log. Cos. 9.88105  
Dec. +  $23^\circ 4' 54''$ ..... Log. Cos. 9.96376

Log. Hav.  $\ominus$  9.19412

Nat. Hav.  $\ominus$  .15635

Lat. ~ Dec.  $17^\circ 25' 6''$ ..... Nat. Hav. .02292

Nat. Hav. z .17927

Equals Calculated Zenith Distance,  $50^\circ 6'$

t ★ Altair,  $2^h 32^m 17^s$ ..... Log. Hav. 9.02684  
Lat. of assumed position,  $40^\circ 30' N$ ..... Log. Cos. 9.88105  
Dec. +  $8^\circ 39' 24''$ ..... Log. Cos. 9.99502

Log. Hav.  $\ominus$  8.90291

Nat. Hav.  $\ominus$  .07997

Lat. ~ Dec.  $31^\circ 50' 36''$ ..... Nat. Hav. .07526

Nat. Hav. z .15523

Equals Calculated Zenith Distance,  $46^\circ 24' 23''$

### NINTH STEP

Get the Calculated h of both stars.  
 $90^\circ$  minus the Calculated Zenith Distance equals the Calculated h.

Cal. z Hamal.....  $90^\circ 00' 00''$   
.....  $50^\circ 6'$   
Cal. h .....  $39^\circ 54' 00''$

Cal. z Altair.....  $90^\circ 00' 00''$   
.....  $46^\circ 24' 23''$   
Cal. h .....  $43^\circ 35' 37''$

### TENTH STEP

Get the Altitude Differences of both stars. See Fig. 38.  
The Altitude Difference is the remainder after subtracting the less h from the greater.

If the Obs. h is greater than the Cal. h, lay off the Alt. Diff. along the line of Azimuth, toward the body from the assumed position.

If the Obs. h is less than the Cal. h, lay off the Alt. Diff. along the line of Azimuth, away from the body from the assumed position.

Obs. h ★ Hamal.....  $39^\circ 57' 20''$   
Cal. h ★ Hamal.....  $39^\circ 54' 00''$   
Alt. Diff. ....  $3' 20''$

Obs. h ★ Altair.....  $43^\circ 49' 49''$   
Cal. h ★ Altair.....  $43^\circ 35' 37''$   
Alt. Diff. ....  $14' 12''$

## Ignition Surety—

"Bosch Equipt" on a list of specifications means Ignition Surety.

Bosch Magneto Ignition is a self-contained source of rip-roaring sparks which get more miles to the gallon and more miles to the hour.

The manufacturer who makes Bosch his standard is spending more money in order to give you a more economically enduring engine.

That's the kind of an engine you want, no matter what type of motor boat you buy.

The nearest Bosch Service Station or Bosch Dealer will give you a convincing demonstration of Bosch Superiority.

*Write for Descriptive Catalog.  
Be Satisfied. Specify Bosch.*

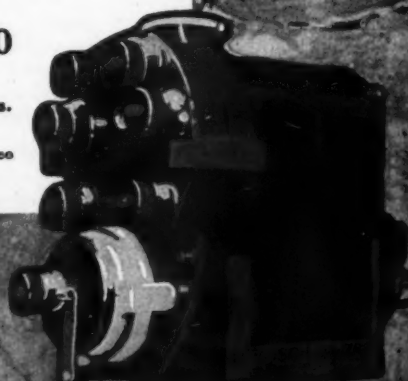
### AMERICAN BOSCH MAGNETO CORPORATION

Main Office and Works: Springfield, Mass.

Branches:

New York Chicago Detroit San Francisco

Service Stations in Over 200 Cities



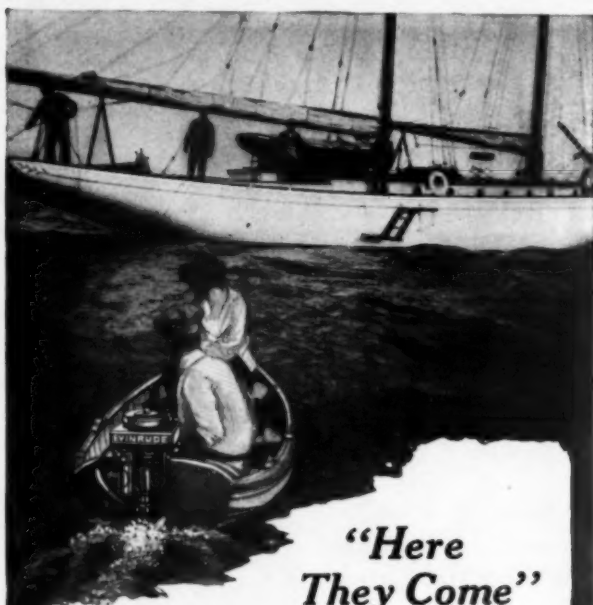
## AMERICA'S SUPREME IGNITION SYSTEM

MOTOR TRUCKS - TRACTORS - AIRPLANES - MOTOR CARS - MOTOR BOATS - MOTORCYCLES - GAS ENGINES - ETC.



*When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating*





**Y**OUR Evinrude will quickly bring the belated guest when your yacht is ready to weigh anchor. You do not have to row to shore—just a turn of the flywheel and the small boat cuts through the water. Shore trips become a pleasure instead of a task.

When the small boat is not in use, it can be hauled on deck. The Evinrude Motor is so light that no davits are required for raising the boat.

## EVINRUDE

### Detachable Motor for Water Craft

furnishes smooth, dependable power for scows, small launches, fishing boats, canoes, rowboats, dinghies.

The Evinrude built-in flywheel type magneto secures smooth power at any desired speed. Its flexibility and the automatic reverse makes it easy to handle an Evinrude-equipped boat under all conditions. Special method of balancing flywheel practically eliminates vibration.

The new Evinrude tilt-up arrangement provides for beaching or for traveling in shallow water. Maxim silencer can be furnished when desired.

Nearly 100,000 Evinrude Motors are already in use. The Evinrude is used by 25 governments.

*Write for Catalog.*

**Evinrude Motor Company**  
70 Evinrude Bldg., Milwaukee, Wis.

#### DISTRIBUTORS:

69 Cortlandt St. . . . . New York, N. Y.  
214 State St. . . . . Boston, Mass.  
436 Market St. . . . . San Francisco, Cal.  
211 Morrison St. . . . . Portland, Ore.

**Durkee's  
Hardware**



**For Wet  
Places**

SEND FOR CIRCULARS DESCRIBING  
The "Andrade" Automatic Windlass  
and  
The "Eells" Stockless Anchors

**CHAS. D. DURKEE & CO., Inc.**  
2 South Street, New York City  
MARINE HARDWARE MANUFACTURERS

Factory: Grassmere, Staten Island, New York City

## TO FLAG USERS



Our customers tell us we make the best flag on the market.

They report at least 50% more service from "Raven Brand" flags.

50% more service would mean a considerable saving to you in one year.

Why not make a little experiment and get your own facts?

Get two flags of the same size, one made by us and the other the best flag you have ever used heretofore. If possible fly them on twin poles simultaneously, but if this is not practical, use them in alternate daily shifts.

We make flags for outdoor service and we are willing to have our flags judged by the amount of outdoor service they will give.

Practically every first class ship chandler on the Atlantic Coast handles "Raven Brand" flags. If your dealer does not handle them, let us know and we will send you the name of a dealer in your city who does.

**BETSY ROSS FLAG CO., Inc.**

Day Line Dock

Newburgh, N. Y.

## READ what one Motor Boatman says about the Motor Boating Practical Handbooks:

Philadelphia, April. 12th., 1919.

Mr. Charles F. Chapman,  
Editor.

Dear Sir:-

Enclosed you will find sixteen cents in stamps which was the cost of sending Practical Motor Boating Books to me.

I am very well pleased with my set of books and I think anyone who is interested in this line of work should have a set. They contain more information about this line of work than any other books I have read on the same subject. Also every subject in the books is clear and understandable.

Yours respectfully,

*John. S. Green*  
4113 Lancaster Ave.  
West Philada. Penna.

*See complete table of contents  
of the Handbooks on page 98.*

If you think you're outclassed, you are,  
You've got to think high, to rise,  
You've got to be sure of yourself before  
You can ever win a prize.  
Life's battles don't always go  
To the stronger or faster man,  
But soon or late, the man who wins  
Is the man who thinks he can.—ELBERT HUBBARD

## Paragon Reverse Gears



**T**O THINK we could build a better Reverse Gear made it possible for us to have the WILL to do so. To build a better Gear meant we had to design it better, build it better and of better materials. And so was born the Paragon Name and the Paragon Ideal.

The Tenets of the Paragon Ideal or Faith were and are:—  
To build Reverse Gears as well as human endeavour, skilled workmen with a real pride in their work, brains and money could produce.

How GOOD could we build them, not how CHEAPLY.

Accept and shoulder a definite responsibility for the good service rendered by every Paragon Reverse Gear.

To have and maintain a lively interest in all Paragon Gears for their entire lifetime.

To make adjustment on the basis that "the user is always right."

To make a friend of every customer and keep that man a friend.

To be just as courteous, just as obliging to the Little Fellow as to the Big Fellow.

Last month a sixteen page advertisement testified rather conclusively to the fact that the Paragon Faith has been a GOOD Faith, rigidly adhered to for many years. In that sixteen page advertisement twenty-seven prominent Marine Engine manufacturers expressed a uniform confidence in Paragon Gears and admitted point blank their superiority.

Our THOUGHT to build a better Reverse Gear and our WILL to do so have resulted in something very worth while—A Successful Product and a Host of honest-to-goodness FRIENDS—and we take more pleasure in the latter than we do in the former.

**PARAGON GEAR WORKS, Taunton, Mass.**

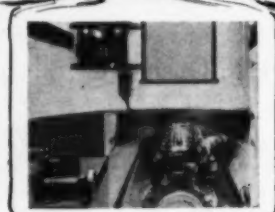
# MATTHEWS

## FULL AUTOMATIC LIGHTING AND POWER PLANTS

Made in these sizes:

15 Light  
50 Light  
100 Light  
250 Light  
500 Light

The New Matthews Book on Automatic Lighting is More Than a Catalog  
Send For It Today

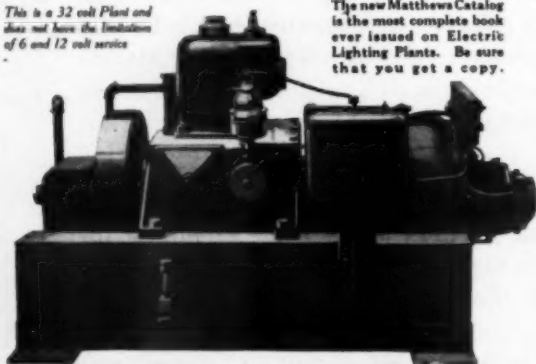


Write today for the new book telling about Matthews Lighting Plants, made in five sizes, that are used in boathouses, cruisers, motor boats, summer cottages, camps and wherever dependable electric light is

desired. Full Automatic Matthews Plants start themselves when load is too great for battery or when battery is partially discharged, adding years to life of battery. Matthews 15-light Plant, shown below, supplies 15 lights from generator only—more when battery is drawn on at same time. Weight 148 lbs., length 22½", height 18½", width 10". The U. S. Government uses Matthews Plants for auxiliary light and power on the new transports, in France for "Y" huts, searchlights, artillery control and portable repair shops.

This is a 32 volt Plant and does not have the limitations of 6 and 12 volt service

The new Matthews Catalog is the most complete book ever issued on Electric Lighting Plants. Be sure that you get a copy.



**MATTHEWS ENGINEERING CO.**

14 Broadway  
SANDUSKY, OHIO

## To Use Your Boat This Summer

(Continued from page 64)

### Amount of Taxes on Use of Motor Boats

Size of Boat	Amount of Tax April 1 to June 30, 1919	Amount of Tax July 1, 1919, to June 30, 1920	Total Tax Payable at once (to June 30, 1920)
Under 5 net tons.....	\$2.50*	\$10.00	\$12.50
Over 5 net tons under 50 feet L. O. A., per foot of length.....	.25*	1.00	1.25
50 feet to 100 feet, per foot of length.....	.50*	2.00	2.50
Over 100 feet in length, per foot of length..	1.00*	4.00	5.00

\*Note: If tax was paid in 1918 you will have a credit of one-half the amount indicated by the \*, therefore your tax up to June 30, 1919, will be the difference, or also one-half of the amount indicated by \*.

Important: If you do not use your boat during the tax year or do not place her in commission, then no tax will have to be paid. A boat used once or more is taxable at the yearly rate.

### Table Showing Number of Motor Boats

	Motor Boats Numbered	Gasoline Yachts Documented	Commercial Gasoline Yachts Documented
Maine .....	2,674	29	559
New Hampshire .....	..	..	7
Vermont .....	90	6	1
Massachusetts .....	2,248	98	541
Rhode Island .....	1,245	14	193
Connecticut .....	1,282	32	201
New York .....	7,440	345	998
New Jersey .....	..	10	152
Pennsylvania .....	2,318	118	411
Delaware .....	..	10	46
Maryland .....	4,700	32	274
District of Columbia..	..	13	6
Virginia .....	2,600	7	596
North Carolina .....	2,201	4	323
South Carolina .....	284	6	150
Georgia .....	320	7	61
Florida .....	5,110	81	499
Alabama .....	574	3	79
Mississippi .....	..	1	60
Louisiana .....	1,496	16	256
Texas .....	740	13	240
Porto Rico .....	..	2	8
Tennessee .....	258	3	86
Kentucky .....	154	..	125
Missouri .....	1,738	10	230
Nebraska .....	66	..	5
North Dakota .....	1	..	38
Montana .....	..	..	11
Iowa .....	1,129	2	42
Minnesota .....	669	7	33
Wisconsin .....	490	27	295
Michigan .....	896	49	302
Illinois .....	1,525	43	132
Indiana .....	205	1	42
Ohio .....	743	15	96
California .....	2,476	24	629
Oregon .....	2,326	2	247
Washington .....	1,685	45	1,333
Alaska .....	..	..	561
Hawaii .....	..	2	23
Total .....	49,683	1,077	9,891

Note: The reason that no boats are recorded in some states in the above list is that boats in those states are numbered in other states.

**RETURN FOR SPECIAL TAX ON PLEASURE BOATS AND AUTOMOBILES.**  
(See instructions on page 64.)

Name (Print name of taxpayer, or in full name of individual) \_\_\_\_\_ (State or town) \_\_\_\_\_ (County) \_\_\_\_\_ (State) \_\_\_\_\_ (Date of issue) \_\_\_\_\_

Address (Number of building, or street, or other street location) \_\_\_\_\_ (City or town) \_\_\_\_\_ (County) \_\_\_\_\_ (State) \_\_\_\_\_ (Date of issue) \_\_\_\_\_

Special Tax on \_\_\_\_\_ (State or town) \_\_\_\_\_ (County) \_\_\_\_\_ (State) \_\_\_\_\_ (Date of issue) \_\_\_\_\_

**AUTOMOBILES.** (A separate return is required for each automobile or boat.)

1. Name of boat \_\_\_\_\_

2. Is boat registered by Navigation Bureau, give Reg. No. \_\_\_\_\_

3. Is boat used exclusively for trade or business? \_\_\_\_\_

4. Is boat built according to plan of Navigation Bureau? \_\_\_\_\_

5. Is boat used exclusively for pleasure? \_\_\_\_\_ (If answer to any of these questions is "No" the boat is not taxable.)

6. What is the net tonnage of boat? \_\_\_\_\_

7. Is boat a motor boat with fixed engine? \_\_\_\_\_

8. What is length of boat over all? \_\_\_\_\_

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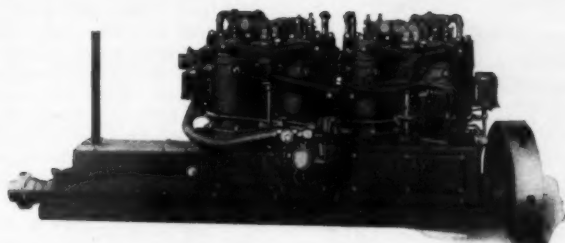
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# Send for the Details of the New Honest Clay four Cylinder Heavy Duty Models



## HONEST-CLAY WORK ENGINES

If you did not respond to the announcement made in the last issue of *MoToR BoatinG* you should *sign and mail the coupon attached to this page to-day*. We have had hundreds of requests for information from boatmen all over the country and we are gratified with the expressions of approval that have resulted from announcing our new models.

These new Honest-Clay 4 cylinder models have been built to meet the continuous demands made upon us for heavy duty power plants of this type. They are made in four sizes as follows:—25, 35, 50 and 80-100 H.P. The new 4 cylinder models have developed from the single and double cylinder Honest-Clay engines that have been on the market for the past 22 years.

They have the same bore and stroke as the two cylinder engines and are remarkably free from vibration. The refinements embraced in these new power plants are seldom found in a motor of the heavy duty type. Full particulars will be sent to interested parties who make use of the coupon attached. **Remember that these motors are not experiments**—they are improvements suggested by our long experience in engine building.

Your profits probably depend on the efficient functioning of your work boat engine. Be sure you power your craft with a motor that will stand up under the severe treatment it is bound to receive in commercial work.

**We can make Prompt Deliveries**

**The Clay Engine Mfg. Co.,**

664 East 72nd Street,

Cleveland, Ohio

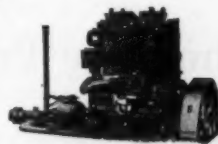
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U. S. A.



**SINGLE CYLINDER  
MODEL**

Built in 6, 8, and 10 H.P.  
Sizes



**DOUBLE CYLINDER  
MODEL**

Built in 12-14; 16-18; 20-22;  
40-50 H. P. Sizes

### Distributors:

NEW YORK—Sutter Bros.  
BOSTON—Walter H. Moreton  
PHILADELPHIA—W. E. Gouchenaur Mfg. Co.  
SEATTLE—Pacific Marine Engine Co.  
PORTLAND, ORE.—F. G. Epton  
NEW ORLEANS—Arthur Duvic

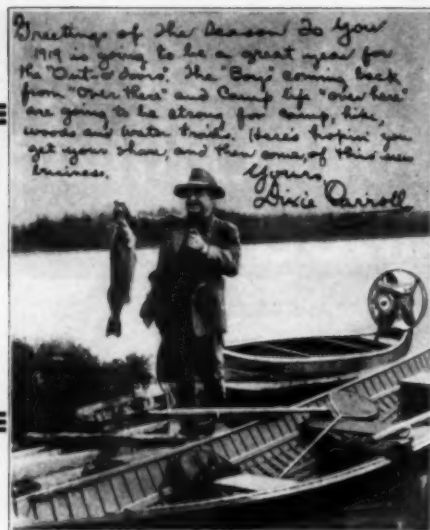
RETURN THIS COUPON FOR FULL INFORMATION REGARDING NEW 4-CYLINDER MODEL

Clay Engine Mfg. Co.—Please send me information regarding your new 4-cylinder model.

I am interested in an engine as follows.....

Name .....

Address .....



**I**F you desire to cruise around in shallow waters you'll have to discard your old propeller, which is never effective unless the water is fairly deep. Do as thousands of others have done. Equip your boat with the ever reliable



which gives you unfailing motive power regardless of wind or depth of water. If you like fishing as hundreds of boatmen do, you will find in the Aerothrust the one efficient means of getting around on lakes, rivers and small streams. The Aerothrust is not an experiment—it has stood the test of time and performance and is today used by hundreds of enthusiastic boatmen.

## The Sure Power Plant

The Aerothrust works on the same principle as the aeroplane. When you are driving against the wind you get greatest speed because the air current increases the propeller thrust. This is a big advantage.

Weeds never trouble the owner of the Aerothrust because he simply glides over them. Under water propulsion has always been a source of trouble in shallower waters and the Aerothrust does away with this trouble forever.

Write for Booklet "What Owners Will Tell You About Aerothrust Engine Service."

**Aerothrust Engine Company**

La Porte

Indiana



## Two Men, a Maid and a Boat

(Continued from page 32)

succeeded. She wobbled around in a scandalous way, finally heading straight for Boojum. Desperately we hauled our boat out to its anchor. Full tilt she bore down upon us, gaining speed as she came. Despairing of saving Boojum we prepared to jump, when just then the sloop, caught in a current of wind, swung about and wobbled weakly up the river.

The water outside looked quieter, and deciding to venture forth again we left Sakonnet at 4 o'clock. Outside a stiff wind was blowing, kicking up quite a sea. We kept going, nevertheless, spurred on by our desire to make Newport that night. We were running at slow speed straight into the face of the setting sun, and the glare on the water was so great that we could hardly see where we were headed. In consequence we picked up a good deal of seaweed and had to shut down the engine to clear the wheel. We passed to the west of the tossing light-ship of Brenton's Reef and about 5 o'clock turned into Narragansett Bay. The water of the Bay was perfectly calm, and Boojum just ate it up—her speed was terrific—or so it seemed to us after creeping in rough water from Sakonnet. Almost weeping from relief we broke the silence we had maintained all the way from Sakonnet, with a duet entitled "Good Old Boojum, See Her Go."

On entering, we found Newport Harbor full of yachts and government boats. The bored-looking sailors hailed us with delight, so, of course, we sped around the harbor just to show them what we could do. We anchored then, fairly close to shore, and while Bayard dressed and went ashore to get supplies, I spread my blankets on the cockpit floor, rolled into them and fell asleep. I had always wanted to visit Newport; here I was now within a stone's throw of it, and too weary to dress and go ashore. I didn't even have any regrets at not seeing it. My blankets completely satisfied me. At 8:30 o'clock the bump of the returning Seive awakened me. Bayard had bought ice-cream and chocolate almonds. We ate that mess, drank some soup, unfurled our mattresses and retired.

It was a beautiful, starlit night; the harbor was alive with brilliantly lighted boats; we fell asleep in our sea-going cradle listening to the sound of a distant band and the roar of fireworks. About midnight I waked up coughing and sneezing, and after that our sleep was fitful. At five the dolorous wail of the fog horn and the constant ringing of the fog-bells roused us. Finding we were surrounded by a thick mist we turned over and went to sleep again. At seven we got up and got our breakfast. By noon, when we started ashore, it had cleared up so that we could see across the harbor, but outside the fog-horn still blew drearily.

Our first visit in Newport was to an art exhibit, where we saw a good many more or less interesting marines, some beautiful pottery and had tea and cake with the wife of the artist. Leaving the studio we walked down the cliff walk, but an approaching shower drove us back to Thames Street, there to collect our purchases and seek a bottle of milk. Failing in our search we returned to Boojum, praying for a clear day.

The next morning found us still fog-bound. We spent the morning scrubbing, polishing and petting the engine. In the afternoon we walked out to Bailey's Beach. We could see only about 300 feet out to sea; the heavy, incoming waves breaking against the cliffs sent great columns of spray over the cliff-walk. To our great disappointment only the servants of Newport were bathing. At the beach we met and talked with a coast-guard, a blue-eyed youngster with an immovable upper-lip who offered to walk us across Bailey's Beach. Bayard, in his best class-conscious manner, declined.

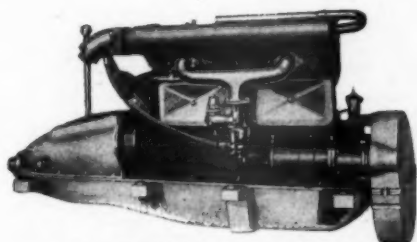
At 9 o'clock we were ready for bed, and before going I stuffed my nose with capsicum vaseline. In a very short time we were up applying good old boat remedies, machine-oil, sea-water and hard grease, to stop the burning. After daybreak Newport Harbor is so noisy that sleep is out of the question, and, as usual, we were awake at 5:30. The fog-bells and horns were still sounding their miserable duet and disgruntled and unhappy at our enforced stay at Newport, we tossed and turned for another hour, saying with every turn, "Well we'd better get up."

(To be continued)

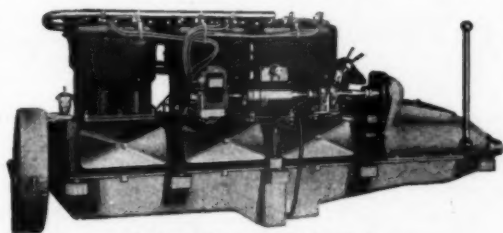


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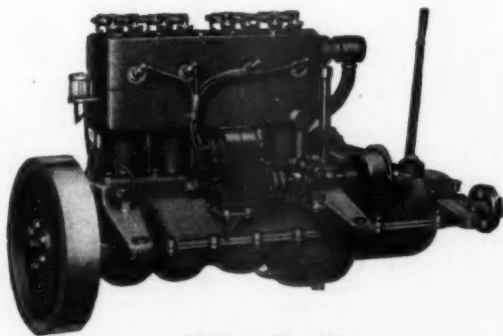
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## Practical Motor Boats and Their Equipment

**Volume 1.**—The first volume tells you what the ideal boat for various kinds of service should be and what to look for in buying a boat. Many suggestions about decoration and hints on all kinds of equipment. All about steering gears, wireless outfits, electrical attachments, etc. Glance over the list of contents appended herewith: Hulls, Ballast and Seaworthiness; Round Bottom vs. Sharp Bilge; What are the Advantages of Flare? Raised Deck vs. Trunk Cabin; Best Proportion of Beam to Length; Selecting a New Design; The Advantages of Bilge Keels; Open or Solid Deadwood? What Makes a Hull Seaworthy? The \$1,000 Cruiser; Buying a Second-Hand Boat; Types of Bows and Sterns; Exterior Arrangement of Cruisers; The Best Cabin Arrangement; Finishing Up the Cabin; Changes in Interior Arrangement; Interior Arrangement for Open Boat; Propeller-Rudder Arrangements; Best Position for the Rudder; Advantages of the Outboard Mudder; Different Steering Positions; Steering Equipments for Motor Boats; Steering Gear for the Cruiser; The Steering Gear for a Runabout; Steering the Boat from the Side; The Electrical Equipment; Making and Wiring a Switchboard; Electric Lighting on a Motor Boat; The Inexpensive Lighting Outfit; Wiring the Small Cruiser; The Storage Battery; The Dynamo Cut-Out; Wireless for a Small Cruiser; Tender for a Thirty-foot Cruiser; Building a Folding Dinghy; Installing the Boat Boom; What is the Best Galley Arrangement; Ventilating the Galley; The Galley Stove and Its Installation; Making a Fireless Cooker; A Portable Cook Box; Running Water for the Cruiser; How to Build a Portable Table; A Table for the Open Boat.

## Practical Motor Boat Building

**Volume 2.**—As its title implies, this volume takes up the building of your own boat. It also covers the construction of the necessary fittings such as awning, windshield, etc. Every boatman sometime or other builds a boat, and a book of this kind will save much time and prevent many mistakes. List of contents: Types of Motor Boat Fastenings; Boat Building Woods; Laying Down a Boat's Lines; Converting a Trunk-Cabin Cruiser; A Steam Box for Amateur Builders; Joiner Between Stem and Keel; Fastening the Frames and Floors; Boring the Forgotten Limbers; Fitting the Garboard Plank; Boring the Shaftlog; Fitting the Stuffing Box; The Stern Bearings for a Cruiser; A Water-Tight Companionway; How to Canvas a Deck; Hinged Water-Tight Hatches; Making a Water-Tight Hatch; The Coaming of an Open Boat; Fitting a Swinging Port Light; Making a Self-Bailing Cockpit; A Water-Tight Window Sash; Making a Water-Tight Skylight; How to Build an Engine Housing; How to Make an Engine Cover; Building a Tool Locker; Constructing an Extension Transom; How to Make a Pipe Berth; An Ice-Box for a Cruiser; Installing a Toilet; How to Rig a Signal Mast; How to Make a Spray Hood; Fitting a Folding Windshield; An Awning for the Open Boat; A Cover for the Open Cockpit; Screens for the Side Light; A Support for the After Light; A Seat for the Man at the Wheel; Removable Davits for the Cruiser; The Boarding Steps; A Bow Rudder for Your Hydro; The Motor-Driven Club Tender.

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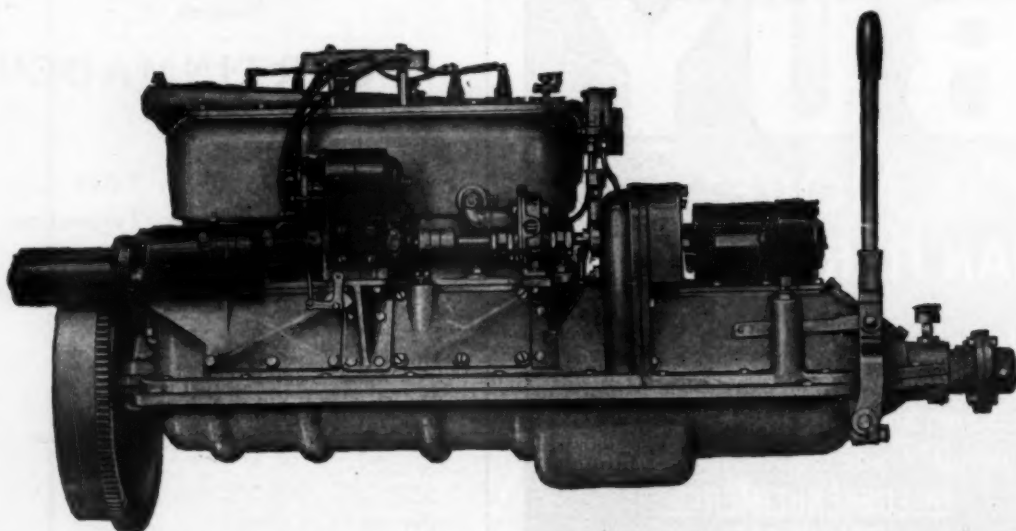
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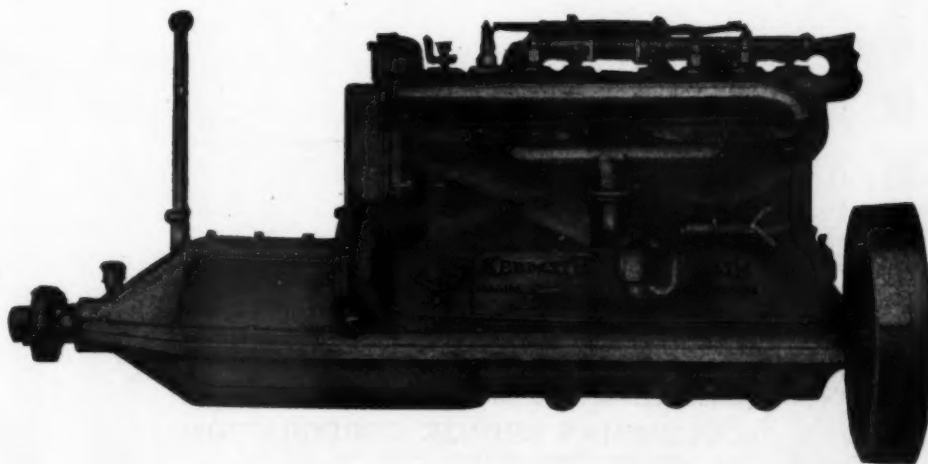
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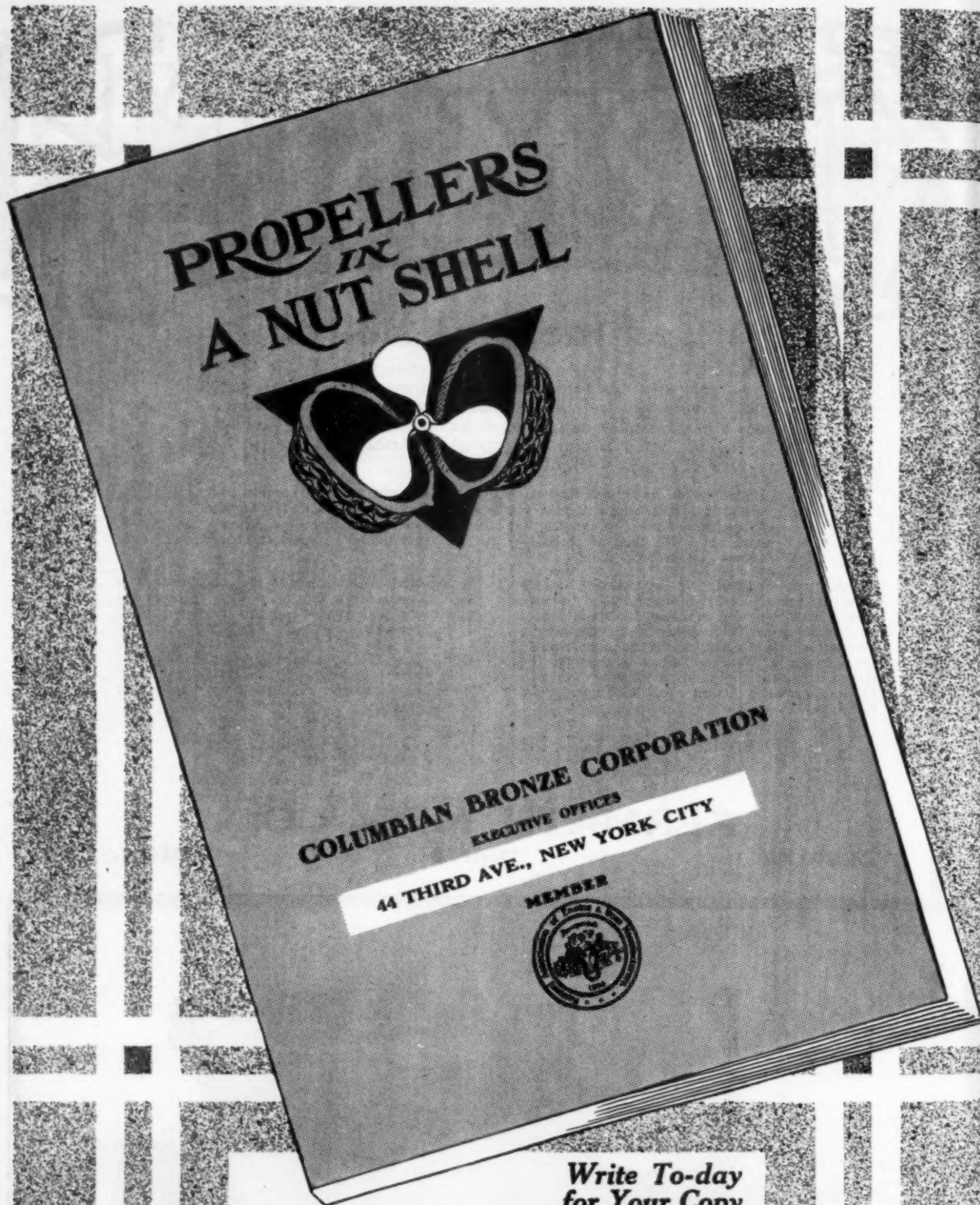
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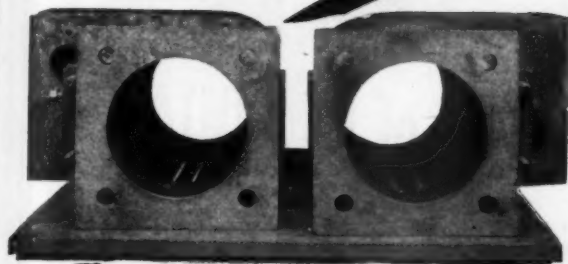
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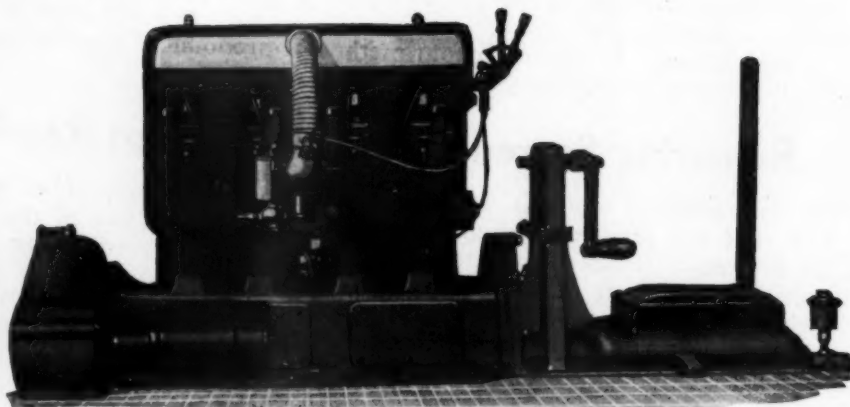


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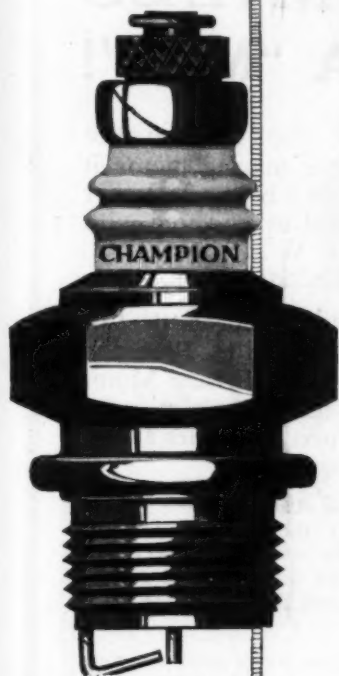
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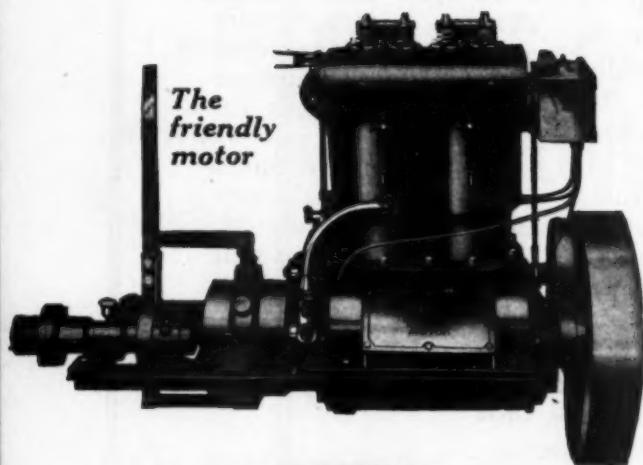
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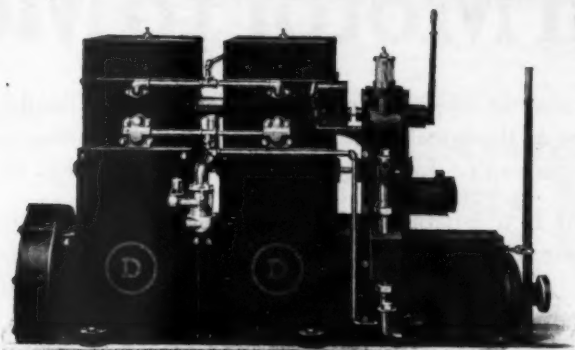
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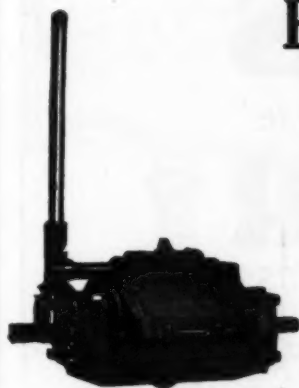


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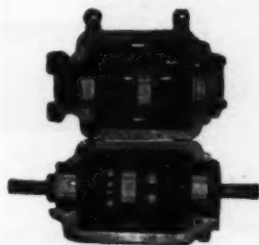
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Nothing but the finest of material is used in the making of the Johnson Marine Reverse Gear and this is one of the reasons it is selected by such reliable builders as Evinrude, Frisbie, Koban, Lockwood-Ash and Sears Roebuck Company.

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*Mfrs. of Heavy Duty and  
High Speed Reverse Gears*

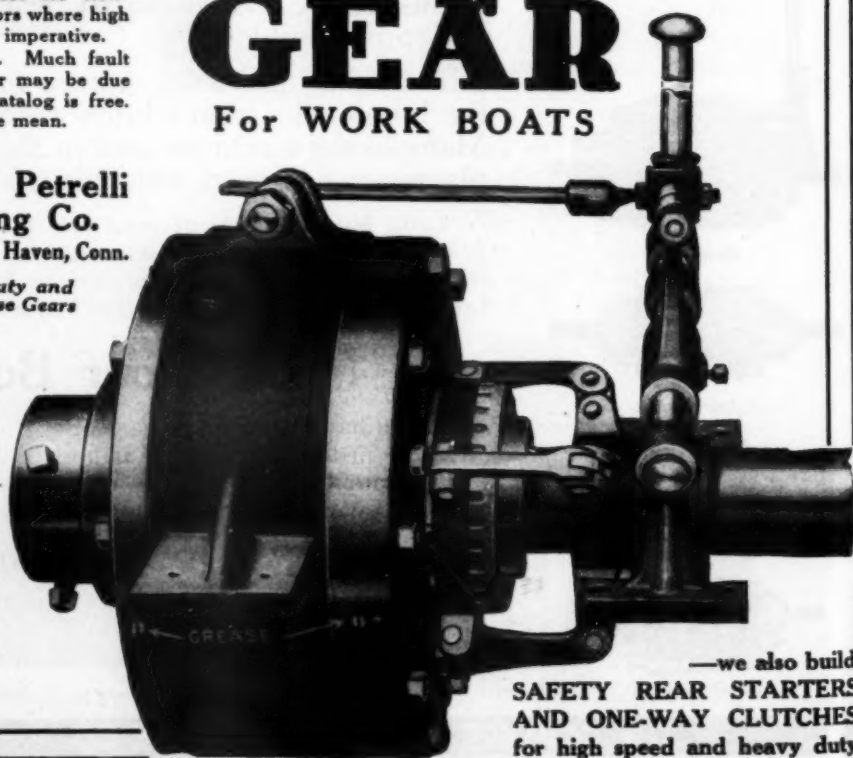
Agents: J. King & Co., 10 Church Row, Limehouse, E. London, England; L. H. Coolidge Co., Seattle, Wash.; W. E. Gochenaur, 631 Arch St., Philadelphia, Pa.; A. R. Williams Machinery Co., Toronto; Sutter Bros., 30-50 Church St., New York City; Service Station, Foot of 92d St., Brooklyn, New York; Marine Equipment Co., Los Angeles Harbor, Wilmington P. O., Cal.; A. G. Hegben, 436 Market St., San Francisco, Cal.; Arendahl Motor and Machine Co., Arendahl, Norway.

# JOES

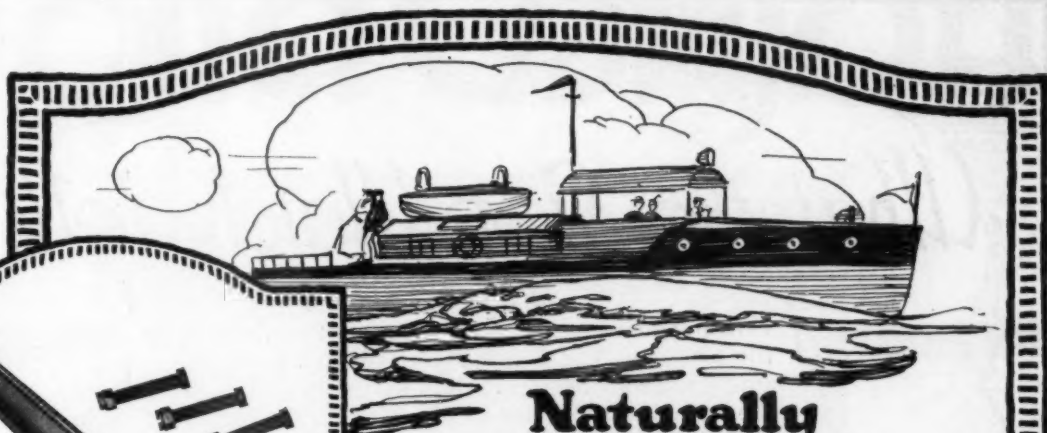
*Heavy Duty, REVERSE*

# GEAR

For WORK BOATS



—we also build  
**SAFETY REAR STARTERS  
AND ONE-WAY CLUTCHES**  
for high speed and heavy duty



## Naturally It Costs More —Here's Why

The WISCONSIN Engine leaves our factory finished—every moving part adjusted—every bearing run in—every cylinder ground accurately to size and every journal fitted perfectly. The WISCONSIN Engine reaches the boat maker ready to install. And it reaches the boat owner ready to carry him one mile or a hundred, running cool, sweet and quiet.

*Wisconsin*  
CONSISTENT

### No Engine is Better than its Rods

WISCONSIN'S Connecting rods are of the I-beam section type, drop-forged of 35% carbon steel and fitted with babbitt lined bronze bushings on the crank shaft end and bronze bushings on the wrist pin end.



Engines cost less in the end.

DEALERS: Consider this when you are thinking about the expensive "service" costs.

BOAT MAKERS: Compare the WISCONSIN'S slightly higher cost with the time of highly-paid men who frequently spend two or three days in your plant trying to make a lower-priced engine run properly.

BOAT OWNERS: Remember you can't walk to a farm house and telephone for a tow when your engine balks far from shore. Isn't an engine that you can depend on worth a slightly higher price?

Metal costs every engine builder about the same but it's the workmanship on a WISCONSIN that counts.

Write for details.

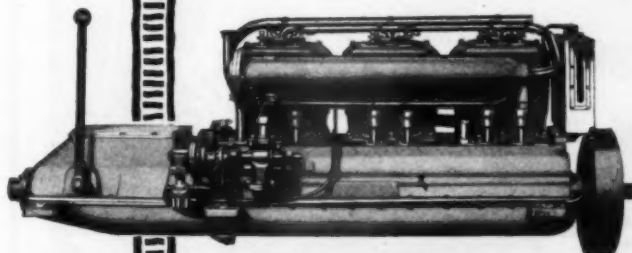
**Wisconsin Motor Mfg. Co.**  
Station A, Dept. 302, Milwaukee, Wis.

**Distributors:**

New York Branch: T. M. Fenner, 21 Park Row,  
Factory Rep.

Marine Equipment & Supply Co.,  
610 Arch St., Philadelphia, Pa.

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# What the Stop-Watch tells

THE performance of your motor depends greatly upon the sort of lubricating oil you are using. Some oils deposit more carbon than others, but the amount deposited matters not so much as the amount that sticks to the cylinders.

Paraffine in an oil has a tendency to form a sticky gum in the combustion chamber which collects the free carbon. The heat of the engine hardens the carbon thus collected, preventing its escape through the exhaust. With no paraffine there is less carbon retained.

Southern oils of asphalt base contain no paraffine, consequently more of the free carbon is blown out with the exhaust.

SUPREME AUTO OIL is manufactured from asphalt base crude and *leaves less carbon*, at the same time giving perfect lubrication.

**Gulf Refining Company**  
General Sales Offices: Pittsburgh, Pa.

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Philadelphia  
New Orleans

Boston  
Houston

There is MORE POWER  
THAT GOOD GULF GASOLINE  
AND SUPREME AUTO OIL

GULF  
REFINING  
COMPANY

# Solid Comfort



## With a Fay & Bowen engine

This man has bought four. The last was a 45 H.P. for his 40 ft. cruiser.

**"The best advertisement is a satisfied customer."**

*(That's "old stuff," but it's true.)*



Some think it an advantage to buy both boat and engine from the same manufacturer. We always have on hand a few Fay & Bowen runabouts, completely equipped and powered with Fay & Bowen engines.

**Send for catalog and bulletins**

## FAY & BOWEN ENGINE COMPANY

104 Lake Street, Geneva, N. Y., U. S. A.

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BOSTON: 111 Haverhill St., Louis T. Carey, Representative

Built for Canada by ST. LAWRENCE ENGINE CO., LTD., BROCKVILLE, ONT.

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# Wyman-Gordon Crankshafts

are properly designed and balanced. They are accurately marked for machining, which is a distinct saving to the manufacturer, made from selected steel and properly heat-treated.

Add to all this our Dependable Service, and you realize what "GUARANTEED FORGINGS" mean to the Engine Builder.

## WYMAN-GORDON COMPANY

*"The Crankshaft Makers"*

WORCESTER, MASS.

CLEVELAND, OHIO



For your own satisfaction—in the interest of efficiency, economy and safety these instruments should be on your boat.

Just pin this advertisement to your letter-head or write us, marking an X opposite the instrument in which you are particularly interested, and full information will be sent to you by return mail.



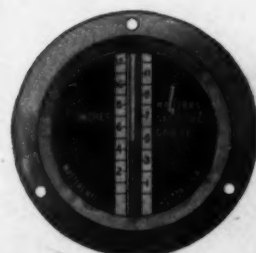
## DO YOU KNOW

- the speed of your boat in miles per hour?
- the revolutions of your engine?
- how much fuel you are using?
- how much fuel is in your tank?

Masters Boatmeters  
Masters Tachometers  
Masters Fuel Meters and  
Masters Fuel Gauges



place this information right before your eyes on the bulkhead, where you can note the facts at a glance, any time.



## Masters Manufacturing Company

(Successor to Irvin W. Masters)

7 Woolsey Square

Jamaica Plain  
Station

Boston, Mass., U. S. A.

# Goblin Soap

WORKS WONDERS

**U**SE Goblin Soap and when you come out of your bath you'll be clean and your flesh will be smooth and healthy.

Work up the soft creamy lather that Goblin Soap makes; then you'll appreciate what we mean when we say it dissolves the dirt; it doesn't scrape or rub; it is gentle, wholesome, cleansing.

*If your dealer does not have Goblin Soap, please send us his name and we will see that you are promptly supplied.*

**CUDAHY, 111 W. Monroe St., CHICAGO**

64 Macauley Ave., Toronto, Canada



